APPENDIX E HYDROLOGY REPORT

HYDROLOGY AND WATER QUALITY

3.4.1 INTRODUCTION

The purpose of this section is to describe the drainage impacts of the proposed project site (Site). Information for Site drainage and grading conditions are taken from "Vesting Tentative Tract No. 53647" and "Hydrology and Preliminary Hydraulics" dated August 2001 (to be named herein as the Engineer's Hydrology Report). Spindler Engineering Corporation in Van Nuys, California prepared the report. The Engineer's Hydrology Report is included in Appendix C.

3.4.2 EXISTING CONDITIONS

General

The watershed associated with the Site is roughly bounded on the south by St. Katherine Drive, on the north by Inverness Drive, on the east by the Inverness Drive and St. Katherine Drive intersection, and on the west by a ridgeline located approximately 350 feet west of the Palmerstone Drive and St. Katherine intersection.

Drainage Patterns

The Site generally drains from south to north. The area within the property boundary is approximately 47 acres, but there are substantial offsite tributary areas entering the Site from the west, south and east. The size of the entire watershed up-slope of Inverness Drive is approximately 150 acres. The offsite tributary areas consist of single-family residences with adjoining steep hillsides.

Three distinct subareas exist within the watershed and are identified as Subareas 1, 2 and 3 (see Figure # 1 in Appendix B). Flows from each subarea concentrates at one of the three low points in Inverness Drive as discussed in the Engineer's Hydrology Report. Flows from Subarea 1 converge at an existing 24-inch culvert at Inverness Drive located at the most westerly low point This low point is referred to as Canyon #1 in the Engineer's Hydrology Report. Storm water from this point flows northerly and ultimately enters into an existing drainage ditch north of Highland Drive.

Flows from Subarea 2 converge at a 24-inch CMP culvert at Inverness Drive located at the middle low point. This middle low point is referred to as Canyon #2 in the Engineer's Hydrology Report. Storm flow from Canyon #2 continues northerly along Inverness Drive and enters into the existing drainage ditch north of Highland Drive.

Flows from Subarea 3 concentrate at the intersection of Inverness Drive and Corona Drive and are conveyed downstream via a system of roadside concrete ditches and underground pipes located along the west side of Corona Drive. The storm water run-off from Subarea 3 flows northerly along Corona Drive and enters the drainage ditch located north of Highland Drive.

Downstream Drainage

Flows within the drainage ditch north of Highland Drive flow easterly and enter the Flint Canyon flood control channel that is presently maintained by the Los Angeles County Department of Public Works. Flows from Flint Canyon continue easterly towards the Devil's Gate Flood Control Basin that is also maintained by the Los Angeles County Department of Public Works. The flood conveyance systems north of Inverness Drive should not be affected by the proposed development provided the required storm water best management practices are implemented.

Regional Flooding

Research at the Federal Emergency Management Agency (FEMA) and the City of La Canada indicates that Flood Insurance Rate Maps (FIRM) have not been prepared. Records are not available that indicate flooding potential for the areas within and downstream of the proposed development.

Surface Water Quality

Surface water quality in urban areas is affected by various point and nonpoint pollutants. Point-source pollutants are those emitted at a specific point, such as a pipe, while nonpoint-source pollutants are typically generated by less confined sources such as streets, residences or landscaped areas. The above mentioned drainage devices receive run-off from a variety of nonpoint sources. As a general rule, point-source pollutants are more easily monitored; thus pollutant discharge standards are more easily enforced, while nonpoint-source pollutants, such as those found in run-off, are more difficult to identify. Even though nonpoint source pollutants are difficult to monitor, they are important contributors to surface water quality, especially in urban areas.

Constituents of run-off water, and their concentrations, vary with surrounding land uses, topography and amount of impervious cover, as well as intensity and frequency of irrigation or rainfall. Run-off may typically contain oil, grease, metals accumulated in streets and driveways, as well as pesticides, herbicides, particulate matter, nutrients, animal wastes and other oxygen-demanding substances from landscaped areas. Concentrations of pollutants in run-off generated during the dry season by landscape irrigation and street washing (dry-weather run-off) are typically lower than concentrations found in wet-weather run-off (run-off generated by precipitation during the wet season). The highest pollutant concentrations are found in storm water run-off generated at the beginning of the wet season, during the so-called "first-flush". Approximately 90 percent of total accumulated pollutants are removed within the first 0.5 inches of rainfall, with street surfaces as the primary source of pollutant in urban areas (EPA, 1999).

Groundwater

The San Rafael Hills represent a recharge area for fractured granitic bedrock and stream channel alluvium. The yield of fractured granitics is fairly low and wells typically produce less than 5 gallons per minute (gpm). The flow is dependent on the degree of fracturing and bedrock weathering. The overlying alluvium in the stream channels forms a thin veneer probably not exceeding 5-feet thick. Groundwater can occur at the alluvium bedrock interface. Groundwater in the fractured granitic bedrock and alluvium flows down gradient towards the Raymond Basin that forms the northwestern portion of the San Gabriel Valley Basin. Depending on fracture orientation a portion of the groundwater may flow towards the Central Basin to the east and the San Fernando Basin to the south.

Groundwater seeps or springs were not observed during the field exploration on December 27, 2002. The field exploration followed a winter storm event when seeps and springs would more likely occur. Specifically groundwater seeps or springs were not observed along granitic exposures or in the area of the proposed graded lots at the Site. Moss suggesting the presence of moisture was observed on granitic outcrops along Monarch Drive.

3.4.3 REGULATORY FRAMEWORK

Per our discussions with the City of La Canada Department of Public Works, a drainage master plan is not currently available. The hydrology sections in the La Canada/Flintridge General Plan mandate that development in hillside areas must be planned and designed in such a manner as to avoid flood, mudslide, and subsidence hazards to residences and structures on or near hillside areas, and downhill of any project.

3.4.4 HYDROLOGY COMPUTATIONS DISCUSSION

Our office has performed a peer review of the Engineer's Hydrology Report dated August 2001 that was prepared by the Spindler Engineering Corporation. The proposed grading design for Lots 10, 11 and 13 attempts to exchange equal drainage areas to maintain the same areas within Subareas 1 and 2 (see Figure # 2 in Appendix B). Tetra Tech agrees with the conclusions of the report that the proposed development will have minimal impact on Canyons #1 and #2. This assumes that appropriate storm water best management practices are implemented such as impervious concrete driveways, detention cisterns, biofiltration swales etc.

The grading and drainage design within Subarea 3 creates changes in the drainage patterns and encourages debris ladened run-off with increased flow volume to a drainage discharge point K at Inverness Drive (see Figure # 2 in Appendix B), and the drainage system located at the intersection of Corona Drive and Inverness Drive. A computation for the before and after development storm flows and maximum debris production volume at point K is attached in Appendix A.

3.4.5 THRESHOLDS OF SIGNIFICANCE

For purposes of the following impact analysis, the proposed project may be deemed to have significant impacts associated with hydrology or water quality if it will:

- Create or contribute run-off water that would exceed the capacity of the receiving, existing or planned storm water drainage systems.
- Cause or expose people, property or structures to a significant risk of loss, injury, or death involving flooding.
- Substantially alter the existing drainage pattern of the site or area that would result in substantial erosion or siltation onsite or offsite.
- Substantially alter the existing drainage pattern of the site or area or substantially increase the rate or amount of surface run-off in a manner that would result in flooding onsite or offsite.
- Substantially degrade surface water quality.
- Cause substantial interference with groundwater recharge or direction and rate of groundwater flow or cause substantial deterioration of groundwater quality.

3.4.6 IMPACTS

Impact on Drainage Pattern

The proposed project will remove trees and existing streambeds to make room for street, building pad, and slope construction. Implementation of the project will alter the existing drainage patterns, direction of mudflows and the rate and amount of surface run-off and debris generated from the Site. The run-off from the proposed development will be collected by a system of catch basins, gutters and drains and discharge into the same watercourse downstream. The general watershed areas and collection or exit points at the Site were used for comparison of existing and proposed flows presented below.

Comparison of Existing and Proposed Flows

The Engineer's Hydrology Report included a tabulation of a preliminary 50-year hydrology analysis based on the Los Angeles County Department of Public Works methodology and computer program for Subareas 1, 2 and 3. Tetra Tech completed a separate interpretation of the changes in subarea patterns from the proposed development. Results showed differences in the area tabulation used in the 50-year hydrology analysis. Accordingly, the flow rates shown below have been calculated using a CFS/acre adjustment factor to arrive at comparable flow rates. The recalculated flow rates show the changes in the storm water run-off that the proposed development will produce at the Site. The area and flow-rate adjustment calculations are shown in Appendix A. A summary of the hydrologic analysis is included in Table 3.4-1 below.

An existing debris basin is located approximately 425 feet northwest of the Palmerstone Drive and Euston Place intersection. The outflow from the basin is a 48-inch diameter reinforced concrete pipe that discharges directly into Inverness Drive via a riprap apron. This apron will act as an energy dissipator to reduce the likelihood of erosion. During field exploration debris deposition was noted both within the basin and at the riprap apron. The proposed design will place an engineered slope over the entire basin, and storm flows from upstream will be picked up by a proposed storm drain that will discharge directly through the existing outfall culvert into Inverness Drive.

A before and after development hydrology calculation for the quantity of storm water in the culvert is included in Appendix A. The volume of potential debris contributing to the outfall before and after development is estimated, and the calculation included in Appendix A. A summary of the culvert flow analysis is shown in Table 3.4-2. A summary of the debris potential analysis is shown in Table 3.4-3.

Table 3.4-1

SUMMARY OF EXISTING AND PROPOSED HYDROLOGY

Flow Destination	Subarea	Before Development*	Post Development*	Difference
Canyon # 1 @ Inverness Drive	1	116 CFS	114 CFS	-2 CFS -1.7%
Canyon # 2 @ Inverness Drive	2	59 CFS	58 CFS	-1 CFS -1.7%
Inverness Drive at Corona Drive Intersection	3	141 CFS	184 CFS	+43 CFS +30.5%

* Clear water flows only and no bulking of flows due to siltation is included

The hydrology analysis indicates that the total clear flow contributing to the existing watercourse and storm drain system downstream will increase by approximately 43 CFS at the intersection of Inverness Drive at Corona Drive. This increase can be attributed to the increase in imperviousness of the Site due to the addition of roofs, driveways, storm drains, hardscape and streets.

Table 3.4-2

SUMMARY OF EXISTING AND PROPOSED STORM FLOWS @ DEBRIS BASIN (Point K in Figure # 2)

Flow Destination	Subarea	Before Development	Post Development	Difference
Debris Basin Outfall	Portion of Subarea 3	26.5 AC/75 CFS	26.5 AC/80 CFS	+5 CFS +6.7%

The hydrology analysis indicates that the total clear flow contributing to the existing debris basin outfall and the streets and storm drain system downstream will increase by approximately 5 CFS. This increase can be attributed to the increase in imperviousness of the Site due to the addition of roofs, driveways, storm drains, hardscape and drainage area diversion due to lot grading.

Table 3.4-3

SUMMARY OF EXISTING AND PROPOSED DEBRIS POTENTIAL @ DEBRIS BASIN (Point K in Figure # 2)

Flow Destination	Subarea	Before Development	Post Development	Difference
Debris Basin Outfall	Portion of Subarea 3	26.5AC 4,200 CY 0 CY at Street	27.0 AC 2,497 CY 750 CY** at Inverness Drive	750 CY

** Debris volume discounted approximately 70%; debris will accumulate at the intersection of Bramley Way and Monarch Drive. The catch basin openings will restrict the amount of debris delivered to Inverness Drive.

The debris potential analysis indicates that the total debris volume contributing to the existing debris basin outfall and the streets and storm drain system downstream will increase by approximately 750 CY. This increase can be attributed to the elimination of the existing debris basin.

Less Than Significant Impacts

Regional Flooding Impacts

Subarea 3 in Table 3.4-1 shows an increase in clear water run-off. However, the increase can be negated by the implementation of storm water management practices such as Site design alternatives and addition of detention basins/cisterns. Field observations suggest that the storm water before and after development will be effectively conveyed to existing downstream storm water facilities. Consequently, the proposed project will not result in the exposure of people or property to regional flooding.

Groundwater Impact

CEQA Guidelines establish that a project will normally have a significant effect on the environment if it will substantially degrade water quality, contaminate a public water supply, substantially degrade or deplete groundwater resources or interfere substantially with groundwater recharge.

The groundwater quality below the proposed project will probably not be impacted. Possible sources of groundwater impact include fertilizers, herbicides and pesticides from residential landscaping, hydrocarbons from vehicles and roads, animal wastes and construction materials such as paints and solvents.

Slopes will be partially stabilized with vegetation that requires minimal watering and fertilization. The residential lots will not be suitable for large areas of grass that require periodic applications of nitrates or other fertilizers. This will reduce the likelihood that increased nitrate levels will enter the Raymond Basin as a result of the proposed project.

The proposed project will not substantially degrade or deplete groundwater resources of the canyon or receiving basin. Although not a public water supply in the project area, the groundwater is an important water resource for the indigenous wildlife in the San Rafael Hills. Some recharge area will be lost because of structures and paving. This area is not significant and may in part be replaced by irrigation water from landscaping.

Potentially Significant Impacts

Surface Drainage

Impact 3.4 -1:
The calculated increase in run-off for Subarea 3 due to construction is approximately 43 CFS per Table 3.4-1 above. This is an increase of approximately 30.5% above existing storm-water flow conditions. The increase can be attributed to the addition of impervious improvements such as roofs, hardscape, driveways, and streets, diversion of flow from improved lot areas and the more efficient transfer of storm water by the proposed storm drain system.

Any increase in run-off may have the potential to adversely affect downstream flooding. This potential impact can be mitigated by installation of an onsite detention basin or cistern and other storm water best management practices to reduce onsite discharge to predevelopment conditions. If the proposed drainage improvements are constructed, the proposed project should not expose people or properties downstream to substantial flooding.

Impact 3.4 -2:
The impact of run-off and debris deposition on Inverness Drive downstream of the existing debris basin at the intersection of Bromley Way and proposed Monarch Drive will be noticeable because of the increased flow rates and elimination of the debris basin.

The increased run-off and debris deposition on the streets will have a significant impact on downstream flooding with a potential for severe mudflows down Inverness Drive and Corona Drive. The added siltation will also clog downstream storm water conveyance systems. The Site design at this location deviates from the City's established policy relating to flooding and mudslides within the City's General Master Plan. Eliminating Lots 2, 3, and 8 and retaining the existing debris basin would eliminate this potential impact.

Surface Water Quality Impacts

Impact 3.4-3:
Grading and construction activities on the project Site have the potential to adversely affect water quality. These activities may increase erosion and contribute sediment to surface waters. Additionally, improper handling of construction materials and/or equipment may result in accidental spills that could adversely affect water quality.

When the project is rough graded, the potential for mud and discharge from the Site will substantially increase during a rainstorm. The amount of silt can be calculated based on potential sediment yield, acreage and slope. Desilting basins and/or silt fences should be sized to retain this sediment. Sandbags placed at catch basin openings and at intervals on proposed roadways and stabilized construction entrances should be detailed on the erosion and sediment control plan

as part of the grading permit. The contractor should install these facilities during rough grading of the Site.

Phasing of the project can also lessen the effect of construction related discharge from the Site by reducing exposure of disturbed areas to storm water run-off. This proposed project will be subject to the provisions of the National Pollutant Discharge Elimination System (NPDES) General Permit for Construction Activity. Under this permit, the developer will be required to eliminate or reduce nonstorm water discharges and to develop and implement a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP must emphasize Best Management Practices (BMPs) to identify and reduce sediment and other pollutants in storm water discharges during construction. The developer will retain a State of California licensed civil engineer to select applicable BMPs and compile the SWPPP based on final Site characteristics, run-off potential, and project design needs. Typical measures that have been proven feasible and are commonly required are listed as Mitigation Measures 3.4-3 and 3.4-4. These measures will reduce Impact 3.4-3 to a less than significant level.

Long-term surface water impacts

Impact 3.4 -4:
The proposed project has the potential for long-term adverse impacts to water quality from addition of pollutants typical of urban run-off. Additional automobile traffic generated from the proposed residential use of the Site, as compared to the current undeveloped condition, could result in an increased incremental concentration of urban contaminants in storm water run-off.

There are no numerical water quality standards that apply to storm water or "nonpoint source" pollution. That is, current federal and state standards apply to "point source pollution." However, the impacts of urban run-off are now well understood and federal municipal storm water regulations require that pollutants in storm water be reduced to the maximum extent practicable. Also, to be in compliance with the provisions of the National Pollutant Discharge Elimination System (NPDES) General Permit for Construction Activity, the Los Angeles County Department of Public Works (LACDPW) has adopted their own Development Planning Model Program in the form of the Standard Urban Storm Water Mitigation Plan (SUSMP). Among other requirements, the SUSMP requires that development projects, including a residential subdivision with more than 10 lots or hillside-located single family dwellings, implement measures that:

- Effectively prohibit nonstorm water discharges;
- Reduce the discharge of pollutants from storm water conveyance systems to the Maximum Extent Practicable.

As part of the reduction of pollutants, the SUSMP requires the treatment or infiltration of storm water run-off based upon volume. This may be accomplished by implementing structural treatment control BMPs specific to the kinds of pollutants that may occur with the development. Implementing effective BMPs would mitigate water quality impacts from storm water run-off for the post-construction activities.

The City of La Canada has requirements for the treatment of the storm run-off per the SUSMP. These requirements include providing treatment and collection of run-off produced from a 0.75-inch storm event over the entire Site, prior to its discharge to the offsite storm water system, and

controlling the peak flow discharge from the Site. To accomplish these requirements, solutions could include detention basins with infiltration provisions. The City will also require a CDS, "Stormceptors" (proprietary manufacturer) or other types of units to remove floating trash and debris and filter the storm water prior to discharge of run-off offsite. Catch basin inserts should not be used because they are not effective in hilly conditions.

Surface water quality will be reduced to a less than significant level with implementation of Mitigation Measures 3.4-2 and 3.4-3, Impact 3.4-4.

3.4.7 CUMULATIVE IMPACTS

The cumulative impact analysis considers development of the proposed project, in conjunction with other developments upstream and downstream of Subareas 1, 2 and 3. These cumulative projects will be various infill residential projects. Cumulative development within the City limits will generate similar hydrology and water quality impacts to those of the proposed project. Each of these projects will be subject to the same basic requirements and mitigation measures as the proposed project. Projects involving construction on sites one acre or greater in size will be required to implement a storm water pollution prevention plan (SWPPP), and all hillside residences will be governed by the SUSMP adopted by City ordinance. Therefore, cumulative development within the City would not have a significant impact on hydrology and water quality.

3.4.8 MITIGATION

Mitigation measures below provide project specific items and typical requirements to be implemented and included in the construction and postconstruction portions of the SWPPP and SUSMP.

Mitigation Measure 3.4-1:

Prior to issuance of a grading permit, a precise grading plan, detention basin/cistern plan, pervious pavement designs and final hydrologic/hydraulic analysis shall be submitted to the City of La Canada for review and approval. Detailed design of the project storm-drain system shall be consistent with the recommendations of the final hydrologic/hydraulic analysis and in conformance with the requirements of the City of La Canada.

Mitigation Measure 3.4-2:

Mitigation of this potential impact can be achieved by the following:

- Eliminate proposed Lots 2, 3 and 8, and leave the debris basin. Provide access to the proposed Lots 5, 6 and 7 by constructing a grade common driveway northwesterly of the Bramley Way and Monarch Drive intersection, or by constructing a bridge from Monarch Drive across the existing streambed.
- Provide a slough wall along the uphill side of Monarch Drive to help reduce mudflows that will be conveyed to Inverness Drive from the proposed storm drain system south of Lot 1.
- Add drought resistant vegetation with geosynthetic matting-fiber-mulch matrix to stabilize the slopes and reduce erosion along the uphill side of Monarch Drive.

Mitigation Measure 3.4-3:

Prior to the issuance of a grading permit, the project applicants shall file a Notice of Intent (NOI) with the State of California and comply with the requirements of the NPDES General Construction Permit. This will include the preparation of a SWPPP incorporating BMPs for construction related control of the Site run-off. This will require construction sediment and erosion control plans in connection with Site grading activities. A State of California licensed civil engineer shall prepare a SWPPP, and the plan should be reviewed and approved by the City of La Canada. The SWPPP should also include the following applicable measures:

- Diversion of offsite run-off away from the construction Site;
- Prompt revegetation of proposed landscaped areas;
- Perimeter sandbagging and silt fences and/or temporary basins to trap sediment;
- Regular sprinkling of exposed soils to control dust during construction;
- Installation of a minor retention basin(s) to alleviate discharge of increased flows;
- Specifications for construction waste handling and disposal;
- Erosion control measures maintained throughout the construction period;
- Construction of stabilized construction entrances to avoid trucks from imprinting debris on City roadways;
- Training of subcontractors on general Site house keeping.

It should be noted that the SWPPP is a "live" document and should be kept current by the person responsible for its implementation.

Mitigation Measure 3.4-4:

Prior to the issuance of the grading permit, the applicant shall submit a SUSMP that shall reduce the discharge of pollutants to the maximum extent practical using best management practices, control techniques and systems, design and engineering methods, and such other provisions that are appropriate. The plans shall include applicable post construction measures such as the following:

- Control of impervious area run-off, including installation of detention basins, retention areas, filtering devices, energy dissipaters, pervious drainage systems, porous pavement alternatives;
- Implement regular sweeping of impervious surfaces such as streets and driveways;
- Use of efficient irrigation practices;
- Provision of infiltration trenches and basins;
- Linings for urban run-off conveyance channels;
- Vegetated swales and strips;
- Protection of slopes and channels;

- Landscape design such as xeriscape or other design minimizing the use of fertilizers;
- Minimize storm water run-off through Site design;
- Construct sloug walls at toes of slopes for sediment control;
- Provide covered trash enclosures;
- Provide post construction BMP's such as the "CDS" or other approved storm water filtration devices at the storm drain system in Monarch Drive and Haverstock Road;
- The developer shall provide proof of obtaining annual maintenance for the proposed basins and BMP's.

APPENDIX A

FLOW RATE ADJUSTMENT CALCULATIONS, FLOW RATES AND DEBRIS POTENTIAL CALCULATION AT DEBRIS BASIN

FLOW RATE ADJUSTMENT CALCULATIONS

Three study conditions are presented in the Engineer's Hydrology Report:

1. Existing Condition;
2. Predevelopment Condition; and
3. Post-Development Condition.

The limits of Subareas shown in the Engineer's Hydrology Report differ somewhat from those established by Tetra Tech for flow rate calculations. The area adjustments are in accordance with the preliminary grading plan and affect the Existing Condition 1 above. Conditions 2 and 3 represent fairly realistic conditions of the Site before and after the proposed development, and the computation results from the Engineer's Hydrology Report are used unchanged. Accordingly, the adjusted flow rates shown are based on a CFS/Acre adjustment factor of flow rates presented in the Engineer's Hydrology Report.

Predevelopment Condition

Flow Destination	Subarea	Area and Q per Engineer's Hydrology Report	Adjustment Factor CFS/Acre	Area and Q after Adjustment
Canyon #1 @ Inverness Drive	1	116 CFS/65 AC	1.7846	116 CFS/65 AC
Canyon #2 @ Inverness Drive	2	59 CFS/21 AC	2.8095	59 CFS/21 AC
Inverness Drive at Corona Drive Intersection	3	141 CFS/64 AC	2.2031	141 CFS/64 AC

Post-Development Condition

Flow Destination	Subarea	Area and Q per Engineer's Hydrology Report	Adjustment Factor CFS/Acre	Area and Q after Adjustment
Canyon #1 @ Inverness Drive	1	108 CFS/62 AC	1.7419	114 CFS/65.3AC
Canyon #2 @ Inverness Drive	2	78 CFS/23 AC	2.8594*	58 CFS/20.2 AC
Inverness Drive at Corona Drive Intersection	3	183 CFS/64 AC	2.8594	184 CFS/64.5AC

*Use adjustment factor for Subarea 3 as the calculated flow rate will appear to be more reasonable.

FLOW RATE CALCULATION AT DEBRIS BASIN

Q50 @ Debris Basin Outlet:

Before Development:
% Imperviousness = 4/26.5 = 15%
TC = 10 Minutes, Ranifall Zone = L
I50 = 3.756
CU = .674 + .064/1.0 x .756 =0.722
CD = .9 x .15 + .722 x (1 - .15) = .135 + .614 = 0.749
Therefore, Q50 = CIA = 0.749 x 3.756 x 26.5 Acres = 75 CFS

After Development:
% Imperviousness = 10/27 = 37%
TC = 10 Minutes
I50 = 3.756
CU = 0.722
CD = .9 x .37 + .722 x (1-.37) = 0.333 + 0.455 = 0.788
Therefore, Q50 = CIA = 0.788 x 3.756 x 27.0 Acres = 80 CFS

DEBRIS POTENTIAL CALCULATIONS AT DEBRIS BASIN

Soil = 068

DPA = 2, @ 227 CY/Acre

Before Grading:
Tributary Area = 26.5 Acres
Ad = 8 Acres
Au = 26.5 – 8 = 18.5 Acres
Therefore DP = 227 x 18.5 x 18.5/26.5 + 227 x 18.5 x 8/26.5 = 2932 + 1268 = 4,200 CY

After Grading:
Tributary Area = 27.0 Acres
Ad = 16 Acres
Au = 27.0 – 16 = 11.0 Acres
Therefore DP = 227 x 11.0 x 11.0/27.0 + 227 x 11.0 x 16/27.0 = 1,017 + 1,480 = 2,497 CY

APPENDIX B

EXHIBITS

APPENDIX C

HYDROLOGY AND PRELIMINARY HYDRAULICS BY SPINDLER ENGINEERING, AUGUST 2001

Hydrology and Preliminary Hydraulics

For

TENTATIVE TRACT NO. 53647
Project Site at:
720 INVERNESS DRIVE
LA CANADA-FLINTRIDGE

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RCE 36138

EXP. 6/30/04

Table of Contents

Introduction/Purpose:

The proposed Project Site is 47.11 Acres and currently vacant land. The Study Area is about 150 Acres of tributary drainage, with the Project Site located close to the middle of the Study Area.

The Study Area is comprised of various previously developed areas surrounding the Project Site. Most of the existing developed land is the Flintridge Academy of the Sacred Heart and surrounding estates. The Study Area is roughly bounded on the South by St. Katherine Drive, on the North by Inverness Drive, on the East by the Inverness Drive and St. Katherine Drive intersection, and on the West by a ridgeline located approximately 350' West of the Palmerstone Drive and St. Katherine intersection.

There are (3) three low points in Inverness Drive where the drainage from the Study Area concentrate, spill over the North side of the roadway, and continue to flow to North, ultimately to the existing creek (flowing East) North of Highland Drive.

This study reviews the pre-developed condition (before any homes), the existing condition (using existing in-place drains) and the post-developed condition (after the Project Site is developed and proposed drains installed).

Hydrology and Drainage Routing

The Study Area in general drains South to North, across & through the Project Site. Three conditions were studied: (1) The pre-developed condition assuming no construction, ignoring existing drains, just existing streets; (2) The existing condition analyzing Study Area with existing streets and drains; (3) The post-developed (proposed) condition, where proposed drains with existing drains and modified drainage patterns analyzed.

For all three conditions the drainage concentrates at three (3) low points in Inverness Drive, where the drainage will spill over to existing canyons and flow to existing creek (flowing East) North of Highland Drive. The 3 low points will be known in this report as Canyon #1 (Westernmost L.P.), Canyon #2 (middle L.P.) and Corona Drive (#3 Easternmost L.P.)

For the drainage to Canyon #1, Westernmost low point, drainage areas do not change for pre-dev. & existing conditions. And only a minor change occurs for the post-developed condition. (see hydrology maps). Pre-Dev and existing Q50 at Canyon #1 is approximately 116cfs, and Post-Dev. Q50 is approximately 108cfs.

For drainage to Canyon #2, the middle low point, drainage areas change very little between all of the conditions. The largest difference is between pre-developed and existing conditions, where with the change in impervious areas and adding of a drain that re-routes the drainage and thus shortens the time of concentration (see hydrology maps). Pre-Dev. Q50 at Canyon #2 is approximately 59cfs, existing Q50 is approximately 77cfs, and Post-Dev. Q50 is approximately 78cfs.

For the drainage to Corona Drive, the Easternmost low point, the largest difference between the conditions analyzed is between the pre-developed and existing conditions for the same reasons as cited for canyon #2. (see hydrology maps). Pre-Dev Q50 at Corona Drive is approximately 141cfs, existing Q50 is approximately 186cfs, and Post-Dev. Q50 is approximately 183cfs.

Most of the Project Site's developed improvements will be in the drainage areas tributary to Canyon #2 and Corona Drive. Very little development will occur now or in future on that portion of Project Site tributary to Canyon #1.

Preliminary Hydraulics:

The existing condition has several existing drains that route flows through the Study Area. Existing drain 'A' picks up drainage from Bramley Way and conveys and outlets to existing natural canyon, that flows to an existing debris/desilting basin that outlets to Inverness Drive via existing drain 'C'. Existing drain 'B' outlets to natural canyon that flows via pipe to the basin (mentioned above). Existing drain 'D' picks up drainage from Haverstock Road, then outlets to Canyon #2. Existing drain 'E' drains directly to Canyon #1. Existing drain 'F' drains from Corona Drive low point to the existing channel that parallels Corona Drive, on the West side.

Post-developed condition will not change existing drains 'C', 'D', 'E', & 'F', but will alter and/or extend existing drains 'A' & 'B'. During construction of site existing drain 'A' will be rerouted into street (Monarch Drive) and then to existing basin (that will be revised due to grading). Existing drain 'B' will be extended to connect to drain 'A'. Drain 'A' will have an additional inlet catch basin added at the sump point in Bramley Way.

New drains added with Project Site construction will be drain 'G', picks up drainage off Monarch Drive before intersection with St. Katherine Drive and outlets to Inverness Drive. Drain 'H' will be constructed to pick up low flows from existing spillover low point in Palmerstone Drive and convey the drainage to Bramley Way. Drain 'I' will pick up drainage from proposed driveway and proposed Lots #9 and #10 and convey via pipe to natural canyon, and then flow will continue to existing drain 'E' and Canyon #1.

Catch basins will be provided where necessary and sized to collect the Q_{25}. Local sump basins will be sized to collect the Q_{50}. (see hydrology map).

Final Hydraulic Calculations for each of the proposed Storm Drain Lines will be prepared and submitted later with the proposed Storm Drain Plans.

Final calculations for the HGL's will be made using WSPG computer program.

Summary:

The proposed development will have very little impact on the existing drainage condition. At the existing low points the total Q50's will, in most cases, be reduced. At Canyon #2 the increase is insignificant. The drainage for this Study Area will be conveyed using the existing drains and the proposed new drains and extensions of the existing drains.

The calculated Clear 50 year Q's exiting the Study Area at Canyons #1 and #2 and at Corona Drive are shown on the Hydrology Map.

Table 1– Study Site Areas == Post Development

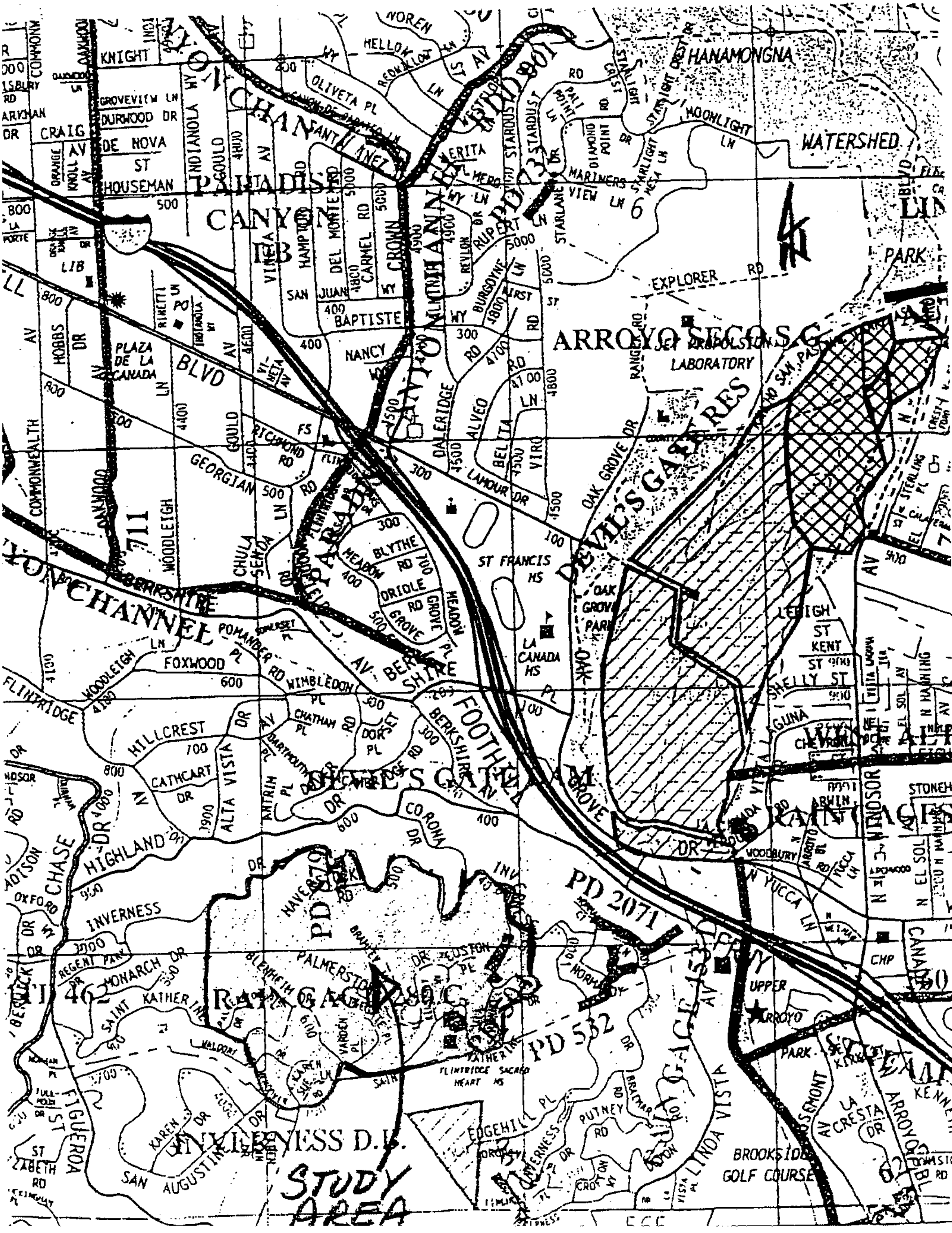
Drainage Area # (MORA#)	Area (Acres)	MORA Areas (Ac)	% Impervious
1A (1A)	10.96 Ac	11 Ac	22%
2A (4A)	23.07 Ac	23 Ac	10%
3A (7A)	27.89 Ac	28 Ac	10%
CYN#1 TOTAL	**61.92 Ac**	**62 Ac**	
4B (8B)	11.07 Ac	11 Ac	22%
5B (10B)	6.08 Ac	6 Ac	0%
5B2 (11B)	6.38 Ac	6 Ac	5%
CYN#2 TOTAL	**23.53 Ac**	**23 Ac**	
6C (13C)	23.29 Ac	23 Ac	15%
7C (15C)	1.98 Ac	2 Ac	0%
7C2+9C2 (19C)	2.89 Ac	3 Ac	15%
9C (20C)	4.81 Ac	5 Ac	5%
10C (21D)	22.78 Ac	23 Ac	10%
8C2 (22D)	2.14 Ac	2 Ac	5%
8C (23D)	4.99 Ac	5 Ac	20%
9C1 (24D)	2.11 Ac	2 Ac	10%
CORONA DRIVE TOTAL	**64.99 Ac**	**65 Ac**	
TOTAL	**150.20 Ac**	**150 Ac**	**12% Avg.**

Table 2 – Study Areas == Existing Developed

Drainage Area # (MORA#)	Area (acres)	MORA Areas (Ac)	% Impervious
1A (1A)	10.96 Ac	11 Ac	22%
2A (4A)	23.07 Ac	23 Ac	10%
3A (7A)	30.97 Ac	31 Ac	10%
CYN#1 TOTAL	**65.00 Ac**	**65 Ac**	
4B (8B)	7.99 Ac	8 Ac	22%
5B (10B)	6.08 Ac	6 Ac	0%
5B2 (11B)	7.22 Ac	7 Ac	5%
CYN#2 TOTAL	**21.29 Ac**	**21 Ac**	
6C (13C)	19.37 Ac	19 Ac	15%
7C (15C)	6.79 Ac	7 Ac	0%
9C (19C)	5.89 Ac	6 Ac	5%
10C (20D)	22.78 Ac	23 Ac	10%
8C (21D)	7.01 Ac	7 Ac	20%
9C2 (22D)	2.07 Ac	2 Ac	10%
CORONA DRIVE TOTAL	**63.91 Ac**	**64 Ac**	
TOTAL	**150.20 Ac**	**150 Ac**	**11.3% Avg.**

Table 3 – Pre-developed Condition Areas (undeveloped/natural)

Drainage Area #(MORA#)	Area (Acres)	MORA Areas(Ac)	% Impervious
1A (1A)	10.96 Ac	11 Ac	22%
2A (4A)	23.07 Ac	23 Ac	10%
3A (7A)	30.97 Ac	31 Ac	10%
CYN#1 TOTAL	65.00 Ac	65 Ac	
4B (8B)	21.29 Ac	21 Ac	10%
CYN#2 TOTAL	21.29 Ac	21 Ac	
5C (11C)	41.13 Ac	41 Ac	10%
6C (10C)	22.78 Ac	23 Ac	10%
CORONA DRIVE TOTAL	63.91 Ac	64 Ac	
TOTAL	**150.20 Ac**	**150 Ac**	**10.9% Avg.**


HANAMONGNA
WATERSHED
EXPLORER RD
ARROYO SECO S.G.
JET PROPULSION LABORATORY
DEVIL'S GATE RES
ST FRANCIS HS
LA CANADA HS
FOOTHILL
PD 2071
PD 532
BERKSHIRE
FOXWOOD
HILLCREST
CATHCART DR
ALTA VISTA
HIGHLAND
INVERNESS
MONARCH
PALMERSTON
FLINTRIDGE SACRED HEART HS
CHASE
FIGUEROA ST
LINDA VISTA
BROOKSIDE GOLF COURSE
UPPER ARROYO PARK
CHP
PLAZA DE LA CANADA
COMMONWEALTH
OAKWOOD
WOODLEIGH
FLINTRIDGE
OAK GROVE
STUDY AREA


CONDOR PEAK 1-H1.38
BURBANK 1-H1.28
MT. WILSON 1-H1.30
LOS ANGELES 1-H1.19
34°15'
118°15'
34°07'30"
118°07'30"
DPA
LEGEND
SOIL CLASSIFICATION AREA
DEBRIS POTENTIAL AREA
RAINFALL ZONE
12
50-YEAR ISOHYET
(MAX. 24-HOUR AMOUNT)
LACDPW
PASADENA
1988
hydrologic map
N
FEET
3000

1679.00

BASE HYDROLOGIC DATA

DRAINAGE AREA LOCATED ON

COUNTY OF LA HYDROLOGIC MAP

#1-HI-29 (PASADENA AREA)

SOIL CLASSIFICATION = 068

RAINFALL ZONE = L

STORM STUDIED = 50YR FREQ.

DEBRIS PRODUCTION = DPA-2

MAX 50YR ISOHYETAL = 14"/24HR

IMPERVIOUS % = 0% to 25% (SEE MAP)
(SEE CALCULATIONS)

3679.00

POST-DEV

DA(MAP)		MORA DA	MORA AREA
1A	=	1A	11 Ac
2A	=	4A	23 Ac
3A	=	7A	28 Ac
4B	=	8B	11 Ac
5B	=	10B	6 Ac
5B2	=	11B	6 Ac
6C	=	13C	23 Ac
7C	=	15C	2 Ac
7C2+9C2	=	19C	3 Ac
9C	=	20C	5 Ac
10C	=	21D	23 Ac
8C2	=	22D	2 Ac

8C = 23D 5Ac

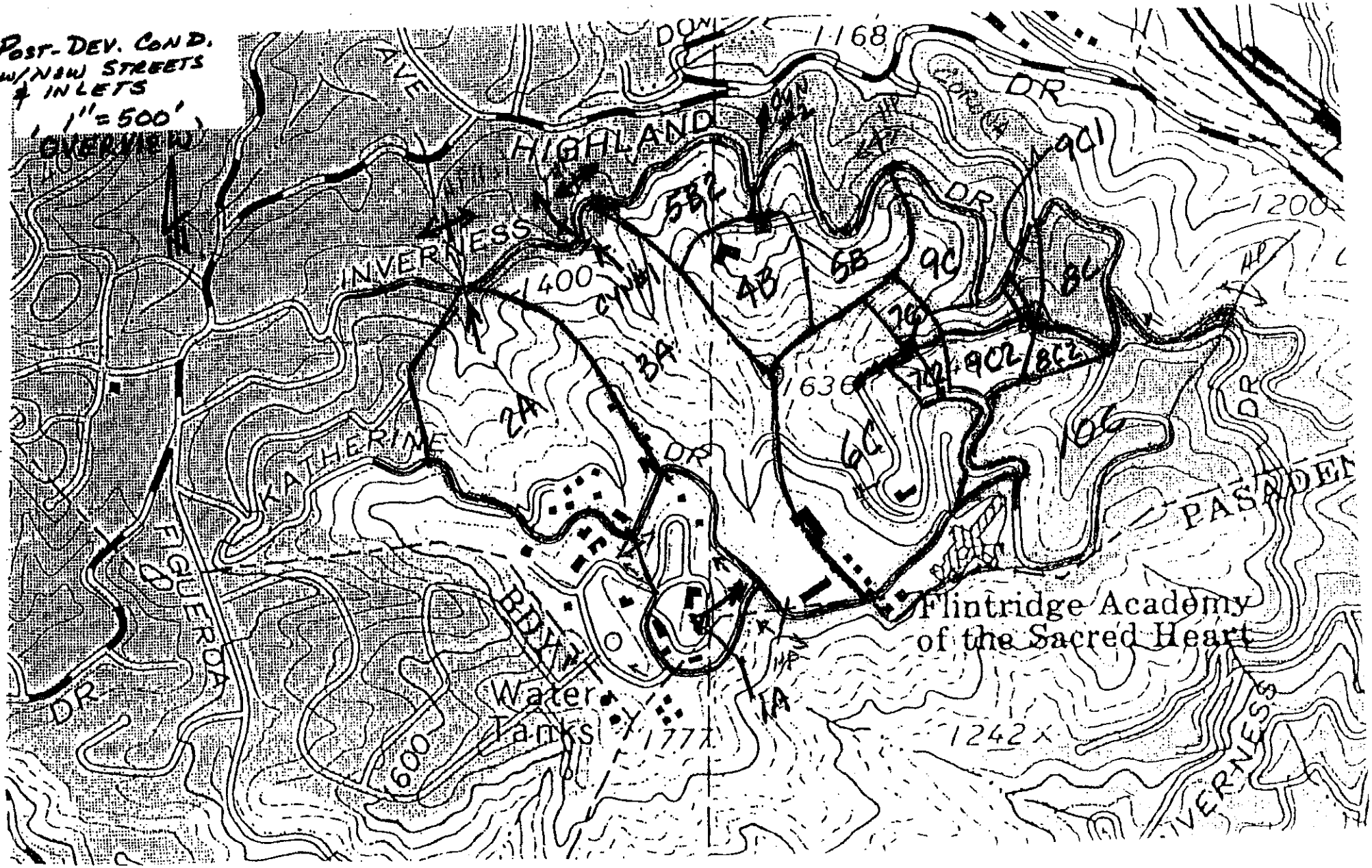
9C1 = 24D 2Ac

TOTAL A = 150 Ac

Q_{50} @ CYN #1 = 108 CFS

Q_{50} @ CYN #2 = 78 CFS

Q_{50} @ INVERNESS/CORONA = 183 CFS


POST-DEV. COND.
W/NEW STREETS
& INLETS
1"=500'
EVERGREEN
HIGHLAND
AVE
DR
INVERNESS
KATHERINE
FIGUEROA
DR
BDY
Water
Tanks
Flintridge Academy
of the Sacred Heart
PASADEN
VERNESS
1168
1200
1400
1242
600
636
5B2
5B
4B
9C
8C
7C
9C2
8C2
6C
6C2
3A
2A
1A

8-20-2001 SITE LICENSEE: SPINDLER ENGINEERING

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

MODIFIED RATIONAL METHOD HYDROLOGY

KUDGRAVE POST DEV COND 50 YR STORM (WITH EX STREETS) 8/20/01 STORM DAY 4

LOCATION		SUBAREA AREA	SUBAREA Q	TOTAL AREA	TOTAL Q	CONV TYPE	CONV LNGTH	CONV SLOPE	CONV SIZE	CONV Z	CONTROL Q	SOIL NAME	TC	RAIN ZONE	PCT IMPV
3679	1A	11.	38.	11.	38.	0	0.	0.00000	0.00	0.00	0.	68	8	L50	0.22
3679	2A	0.	0.	11.	38.	3	850.	0.10000	0.00	0.00	0.	68	99	L50	0.00
3679	3A	0.	0.	11.	37.	1	1400.	0.12500	0.00	0.00	0.	68	99	L50	0.00
3679	4A	23.	61.	34.	82.	0	0.	0.00000	0.00	0.00	0.	68	11	L50	0.10

CONFLUENCE Q'S

3679 5A TA 1159 QA 82. QAF 41. QF 41. 3679 5F TF 1159 QF 41. QFA 41. QA 82.

3679 5AF TAF 1159 QAF 41. QA 82. QF 41.

LOCATION		SUBAREA AREA	SUBAREA Q	TOTAL AREA	TOTAL Q	CONV TYPE	CONV LNGTH	CONV SLOPE	CONV SIZE	CONV Z	CONTROL Q	SOIL NAME	TC	RAIN ZONE	PCT IMPV
3679	5AF	0.	41.	34.	41.	0	0.	0.00000	0.00	0.00	50.	68	0	L50	0.00
3679	6A	0.	0.	34.	41.	3	550.	0.06000	0.00	0.00	0.	68	99	L50	0.00
3679	7A	28.	74.	62.	108.	0	0.	0.00000	0.00	0.00	0.	68	11	L50	0.10
3679	8B	11.	35.	11.	35.	4	150.	0.25000	2.00	0.00	0.	68	9	L50	0.22
3679	9B	0.	0.	11.	35.	0	0.	0.00000	0.00	0.00	0.	68	99	L50	0.00
3679	10B	6.	21.	17.	56.	0	0.	0.00000	0.00	0.00	0.	68	7	L50	0.00
3679	11B	6.	22.	23.	78.	0	0.	0.00000	0.00	0.00	0.	68	7	L50	0.05
3679	12B	0.	0.	23.	78.	0	0.	0.00000	0.00	0.00	0.	68	99	L50	0.00
3679	13C	23.	58.	23.	58.	0	0.	0.00000	0.00	0.00	0.	68	12	L50	0.15
3679	14C	0.	0.	23.	58.	4	500.	0.15000	2.00	0.00	0.	68	99	L50	0.00
3679	15C	2.	9.	25.	66.	0	0.	0.00000	0.00	0.00	0.	68	5	L50	0.00
3679	16C	0.	0.	25.	66.	4	250.	0.05000	2.00	0.00	0.	68	99	L50	0.00
3679	17C	0.	0.	25.	66.	0	0.	0.00000	0.00	0.00	0.	68	99	L50	0.00
3679	18C	0.	0.	25.	66.	4	400.	0.06000	2.25	0.00	0.	68	99	L50	0.00
3679	19C	3.	14.	28.	78.	4	200.	0.25000	2.00	0.00	0.	68	5	L50	0.15
3679	20C	5.	20.	33.	96.	0	0.	0.00000	0.00	0.00	0.	68	6	L50	0.05
3679	21D	23.	57.	23.	57.	0	0.	0.00000	0.00	0.00	0.	68	12	L50	0.10
3679	22D	2.	9.	25.	66.	3	1050.	0.10000	0.00	0.00	0.	68	5	L50	0.05
3679	23D	5.	21.	30.	81.	3	150.	0.10000	0.00	0.00	0.	68	6	L50	0.20
3679	24D	2.	9.	32.	87.	0	0.	0.00000	0.00	0.00	0.	68	5	L50	0.10

CONFLUENCE Q'S

3679 25C TC 1155 QC 96. QCD 183. QD 87. 3679 25D TD 1155 QD 87. QDC 183. QC 96.

3679 25CD TCD 1155 QCD 183. QC 96. QD 87.

LOCATION		SUBAREA AREA	SUBAREA Q	TOTAL AREA	TOTAL Q	CONV TYPE	CONV LNGTH	CONV SLOPE	CONV SIZE	CONV Z	CONTROL Q	SOIL NAME	TC	RAIN ZONE	PCT IMPV
3679	25CD	32.	87.	65.	183.	0	0.	0.00000	0.00	0.00	0.	68	0	L50	0.00
3679	26C	0.	0.	65.	183.	0	0.	0.00000	0.00	0.00	0.	68	99	L50	0.00

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY
EX COND 50 YR Q AT SUMP PT IN ST KATHERINE DR
HYDROGRAPH AT 3679 2A STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	0.	200	0.	300	1.	400	1.
500	1.	600	1.	700	2.	800	2.	900	3.
1000	4.	1050	5.	1100	4.	1110	5.	1120	6.
1130	6.	1131	7.	1132	7.	1133	7.	1134	7.
1135	7.	1136	8.	1137	8.	1138	8.	1139	9.
1140	9.	1141	9.	1142	9.	1143	10.	1144	10.
1145	10.	1146	11.	1147	11.	1148	12.	1149	14.
1150	17.	1151	23.	1152	33.	1153	37.	1154	38.
1155	38.	1156	36.	1157	33.	1158	30.	1159	23.
1160	12.	1161	8.	1162	7.	1163	6.	1164	6.
1165	6.	1166	6.	1167	6.	1168	5.	1169	5.
1170	5.	1171	5.	1172	5.	1173	5.	1174	5.
1175	5.	1176	5.	1177	4.	1178	4.	1179	4.
1180	4.	1181	4.	1182	4.	1183	4.	1184	4.
1185	4.	1186	4.	1187	4.	1188	4.	1189	4.
1190	4.	1191	4.	1192	4.	1193	4.	1194	4.
1195	4.	1196	4.	1197	4.	1198	4.	1199	4.
1200	4.	1201	4.	1202	4.	1203	4.	1204	4.
1205	4.	1206	4.	1207	4.	1208	4.	1209	4.
1210	4.	1211	3.	1212	3.	1213	3.	1214	3.
1215	3.	1216	3.	1217	3.	1218	3.	1219	3.
1220	3.	1221	3.	1222	3.	1223	3.	1224	3.
1225	3.	1226	3.	1227	3.	1228	3.	1229	3.
1230	3.	1231	3.	1232	3.	1233	3.	1234	3.
1235	3.	1236	3.	1237	3.	1238	3.	1239	3.
1240	3.	1241	3.	1242	3.	1243	3.	1244	3.
1245	3.	1246	3.	1247	3.	1248	3.	1249	3.
1250	3.	1251	3.	1252	3.	1253	3.	1254	3.
1255	3.	1256	3.	1257	3.	1258	3.	1259	3.
1260	3.	1261	2.	1262	2.	1263	2.	1264	2.
1265	2.	1266	2.	1267	2.	1268	2.	1269	2.
1270	2.	1271	2.	1272	2.	1273	2.	1274	2.
1275	2.	1276	2.	1277	2.	1278	2.	1279	2.
1280	2.	1281	2.	1282	2.	1283	2.	1284	2.
1285	2.	1286	2.	1287	2.	1288	2.	1289	2.
1290	2.	1291	2.	1292	2.	1293	2.	1294	2.
1295	2.	1296	2.	1297	2.	1298	2.	1299	2.
1300	2.	1310	1.	1320	1.	1330	1.	1340	1.
1350	1.	1360	1.	1370	1.	1380	1.	1390	1.
1400	1.	1420	0.	1440	0.	1460	0.	1500	0.

Total Runoff = 4.099 Acre-Ft.
Peak Q = 38 CFS
Time to Peak Q = 1154 Minutes

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY
EX COND 50 YR STORM Q AT INVERNESS BEFORE 50/50 SPLIT

HYDROGRAPH AT 3679 4A STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	1.	200	1.	300	1.	400	2.
500	2.	600	3.	700	5.	800	6.	900	8.
1000	9.	1050	12.	1100	12.	1110	13.	1120	15.
1130	17.	1131	17.	1132	18.	1133	18.	1134	18.
1135	19.	1136	19.	1137	20.	1138	21.	1139	21.
1140	22.	1141	23.	1142	23.	1143	24.	1144	25.
1145	26.	1146	27.	1147	28.	1148	29.	1149	33.
1150	37.	1151	47.	1152	63.	1153	69.	1154	71.
1155	72.	1156	74.	1157	77.	1158	80.	1159	82.
1160	81.	1161	77.	1162	67.	1163	50.	1164	42.
1165	37.	1166	33.	1167	30.	1168	27.	1169	24.
1170	22.	1171	20.	1172	19.	1173	18.	1174	17.
1175	16.	1176	16.	1177	15.	1178	14.	1179	14.
1180	13.	1181	13.	1182	13.	1183	13.	1184	12.
1185	12.	1186	12.	1187	12.	1188	12.	1189	12.
1190	12.	1191	11.	1192	11.	1193	11.	1194	11.
1195	11.	1196	11.	1197	11.	1198	10.	1199	10.
1200	10.	1201	10.	1202	10.	1203	10.	1204	10.
1205	10.	1206	10.	1207	10.	1208	10.	1209	10.
1210	10.	1211	9.	1212	9.	1213	9.	1214	9.
1215	9.	1216	9.	1217	9.	1218	9.	1219	8.
1220	8.	1221	8.	1222	8.	1223	8.	1224	8.
1225	8.	1226	8.	1227	8.	1228	8.	1229	8.
1230	8.	1231	8.	1232	8.	1233	7.	1234	7.
1235	7.	1236	7.	1237	7.	1238	7.	1239	7.
1240	7.	1241	7.	1242	7.	1243	7.	1244	7.
1245	7.	1246	7.	1247	7.	1248	7.	1249	7.
1250	7.	1251	7.	1252	7.	1253	7.	1254	7.
1255	7.	1256	7.	1257	7.	1258	7.	1259	7.
1260	7.	1261	6.	1262	6.	1263	6.	1264	6.
1265	6.	1266	6.	1267	6.	1268	6.	1269	5.
1270	5.	1271	5.	1272	5.	1273	5.	1274	5.
1275	5.	1276	5.	1277	5.	1278	5.	1279	5.
1280	5.	1281	5.	1282	5.	1283	5.	1284	5.
1285	5.	1286	5.	1287	5.	1288	5.	1289	5.
1290	5.	1291	5.	1292	5.	1293	5.	1294	5.
1295	5.	1296	5.	1297	5.	1298	5.	1299	5.
1300	5.	1310	3.	1320	3.	1330	3.	1340	3.
1350	2.	1360	2.	1370	2.	1380	1.	1390	1.
1400	1.	1420	1.	1440	1.	1460	0.	1500	0.

Total Runoff = 10.825 Acre-Ft.
Peak Q = 82 CFS
Time to Peak Q = 1159 Minutes

8-20-2001 SITE LICENSEE: SPINDLER ENGINEERING

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY
EX CONDITION 50 YR Q AFTER SPLIT
HYDROGRAPH AT 3679 6A STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	0.	200	0.	300	1.	400	1.
500	1.	600	2.	700	2.	800	3.	900	4.
1000	5.	1050	6.	1100	6.	1110	7.	1120	7.
1130	8.	1131	9.	1132	9.	1133	9.	1134	9.
1135	9.	1136	10.	1137	10.	1138	10.	1139	11.
1140	11.	1141	11.	1142	12.	1143	12.	1144	12.
1145	13.	1146	13.	1147	14.	1148	15.	1149	16.
1150	19.	1151	23.	1152	31.	1153	34.	1154	36.
1155	36.	1156	37.	1157	38.	1158	40.	1159	41.
1160	40.	1161	38.	1162	34.	1163	25.	1164	21.
1165	18.	1166	16.	1167	15.	1168	13.	1169	12.
1170	11.	1171	10.	1172	10.	1173	9.	1174	9.
1175	8.	1176	8.	1177	7.	1178	7.	1179	7.
1180	7.	1181	7.	1182	6.	1183	6.	1184	6.
1185	6.	1186	6.	1187	6.	1188	6.	1189	6.
1190	6.	1191	6.	1192	6.	1193	6.	1194	5.
1195	5.	1196	5.	1197	5.	1198	5.	1199	5.
1200	5.	1201	5.	1202	5.	1203	5.	1204	5.
1205	5.	1206	5.	1207	5.	1208	5.	1209	5.
1210	5.	1211	5.	1212	5.	1213	5.	1214	5.
1215	4.	1216	4.	1217	4.	1218	4.	1219	4.
1220	4.	1221	4.	1222	4.	1223	4.	1224	4.
1225	4.	1226	4.	1227	4.	1228	4.	1229	4.
1230	4.	1231	4.	1232	4.	1233	4.	1234	4.
1235	4.	1236	4.	1237	4.	1238	4.	1239	4.
1240	3.	1241	3.	1242	3.	1243	3.	1244	3.
1245	3.	1246	3.	1247	3.	1248	3.	1249	3.
1250	3.	1251	3.	1252	3.	1253	3.	1254	3.
1255	3.	1256	3.	1257	3.	1258	3.	1259	3.
1260	3.	1261	3.	1262	3.	1263	3.	1264	3.
1265	3.	1266	3.	1267	3.	1268	3.	1269	3.
1270	3.	1271	3.	1272	3.	1273	3.	1274	3.
1275	3.	1276	3.	1277	2.	1278	2.	1279	2.
1280	2.	1281	2.	1282	2.	1283	2.	1284	2.
1285	2.	1286	2.	1287	2.	1288	2.	1289	2.
1290	2.	1291	2.	1292	2.	1293	2.	1294	2.
1295	2.	1296	2.	1297	2.	1298	2.	1299	2.
1300	2.	1310	2.	1320	2.	1330	1.	1340	1.
1350	1.	1360	1.	1370	1.	1380	1.	1390	1.
1400	1.	1420	0.	1440	0.	1460	0.	1500	0.

Total Runoff = 5.360 Acre-Ft.
Peak Q = 41 CFS
Time to Peak Q = 1159 Minutes

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY
POST COND 50 YR Q AT SUMP PT SPILL OVER TO NATURAL CANYON #1
HYDROGRAPH AT 3679 7A STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	1.	200	1.	300	2.	400	2.
500	3.	600	4.	700	6.	800	8.	900	10.
1000	12.	1050	16.	1100	15.	1110	17.	1120	19.
1130	22.	1131	23.	1132	23.	1133	24.	1134	24.
1135	25.	1136	25.	1137	26.	1138	27.	1139	28.
1140	29.	1141	30.	1142	31.	1143	32.	1144	33.
1145	35.	1146	36.	1147	37.	1148	39.	1149	44.
1150	50.	1151	63.	1152	86.	1153	98.	1154	106.
1155	108.	1156	108.	1157	108.	1158	107.	1159	106.
1160	102.	1161	95.	1162	82.	1163	59.	1164	46.
1165	38.	1166	34.	1167	31.	1168	29.	1169	27.
1170	25.	1171	24.	1172	23.	1173	21.	1174	20.
1175	20.	1176	19.	1177	18.	1178	18.	1179	17.
1180	16.	1181	16.	1182	16.	1183	15.	1184	15.
1185	15.	1186	15.	1187	15.	1188	15.	1189	15.
1190	15.	1191	14.	1192	14.	1193	14.	1194	14.
1195	13.	1196	13.	1197	13.	1198	13.	1199	13.
1200	13.	1201	12.	1202	12.	1203	12.	1204	12.
1205	12.	1206	12.	1207	12.	1208	12.	1209	12.
1210	12.	1211	12.	1212	12.	1213	12.	1214	11.
1215	11.	1216	11.	1217	11.	1218	11.	1219	10.
1220	10.	1221	10.	1222	10.	1223	10.	1224	10.
1225	10.	1226	10.	1227	10.	1228	10.	1229	10.
1230	10.	1231	10.	1232	9.	1233	9.	1234	9.
1235	9.	1236	9.	1237	9.	1238	9.	1239	9.
1240	9.	1241	8.	1242	8.	1243	8.	1244	8.
1245	8.	1246	8.	1247	8.	1248	8.	1249	8.
1250	8.	1251	8.	1252	8.	1253	8.	1254	8.
1255	8.	1256	8.	1257	8.	1258	8.	1259	8.
1260	8.	1261	8.	1262	8.	1263	8.	1264	7.
1265	7.	1266	7.	1267	7.	1268	7.	1269	6.
1270	6.	1271	6.	1272	6.	1273	6.	1274	6.
1275	6.	1276	6.	1277	6.	1278	6.	1279	6.
1280	6.	1281	6.	1282	6.	1283	6.	1284	6.
1285	6.	1286	6.	1287	6.	1288	6.	1289	6.
1290	6.	1291	6.	1292	6.	1293	6.	1294	6.
1295	6.	1296	6.	1297	6.	1298	6.	1299	6.
1300	6.	1310	4.	1320	4.	1330	3.	1340	3.
1350	2.	1360	2.	1370	2.	1380	2.	1390	2.
1400	2.	1420	1.	1440	1.	1460	0.	1500	0.

Total Runoff = 13.860 Acre-Ft.
Peak Q = 108 CFS
Time to Peak Q = 1155 Minutes

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY
POST-DEV COND 50 YR Q AT EX CB INLETS IN HAVERSTOCK RD
HYDROGRAPH AT 3679 9B STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	0.	200	0.	300	1.	400	1.
500	1.	600	1.	700	2.	800	2.	900	3.
1000	4.	1050	5.	1100	4.	1110	5.	1120	6.
1130	6.	1131	7.	1132	7.	1133	7.	1134	7.
1135	7.	1136	7.	1137	8.	1138	8.	1139	8.
1140	9.	1141	9.	1142	9.	1143	10.	1144	10.
1145	10.	1146	10.	1147	11.	1148	11.	1149	13.
1150	16.	1151	20.	1152	29.	1153	34.	1154	35.
1155	35.	1156	34.	1157	33.	1158	30.	1159	27.
1160	22.	1161	13.	1162	8.	1163	7.	1164	6.
1165	6.	1166	6.	1167	6.	1168	6.	1169	6.
1170	5.	1171	5.	1172	5.	1173	5.	1174	5.
1175	5.	1176	5.	1177	5.	1178	4.	1179	4.
1180	4.	1181	4.	1182	4.	1183	4.	1184	4.
1185	4.	1186	4.	1187	4.	1188	4.	1189	4.
1190	4.	1191	4.	1192	4.	1193	4.	1194	4.
1195	4.	1196	4.	1197	4.	1198	4.	1199	4.
1200	4.	1201	4.	1202	4.	1203	4.	1204	4.
1205	4.	1206	4.	1207	4.	1208	4.	1209	4.
1210	4.	1211	3.	1212	3.	1213	3.	1214	3.
1215	3.	1216	3.	1217	3.	1218	3.	1219	3.
1220	3.	1221	3.	1222	3.	1223	3.	1224	3.
1225	3.	1226	3.	1227	3.	1228	3.	1229	3.
1230	3.	1231	3.	1232	3.	1233	3.	1234	3.
1235	3.	1236	3.	1237	3.	1238	3.	1239	3.
1240	3.	1241	3.	1242	3.	1243	3.	1244	3.
1245	3.	1246	3.	1247	3.	1248	3.	1249	3.
1250	3.	1251	3.	1252	3.	1253	3.	1254	3.
1255	3.	1256	3.	1257	3.	1258	3.	1259	3.
1260	3.	1261	2.	1262	2.	1263	2.	1264	2.
1265	2.	1266	2.	1267	2.	1268	2.	1269	2.
1270	2.	1271	2.	1272	2.	1273	2.	1274	2.
1275	2.	1276	2.	1277	2.	1278	2.	1279	2.
1280	2.	1281	2.	1282	2.	1283	2.	1284	2.
1285	2.	1286	2.	1287	2.	1288	2.	1289	2.
1290	2.	1291	2.	1292	2.	1293	2.	1294	2.
1295	2.	1296	2.	1297	2.	1298	2.	1299	2.
1300	2.	1310	1.	1320	1.	1330	1.	1340	1.
1350	1.	1360	1.	1370	1.	1380	1.	1390	1.
1400	1.	1420	0.	1440	0.	1460	0.	1500	0.

Total Runoff = 4.099 Acre-Ft.
Peak Q = 35 CFS
Time to Peak Q = 1154 Minutes

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LOS ANGELES COUNTY FLOOD CONTROL DISTRICT PROG FO601A

MODIFIED RATIONAL METHOD HYDROLOGY

POST-DEV 50 YR Q TO SUMP PT SPILL OVER TO NATURAL CANYON #2

HYDROGRAPH AT 3679 12B STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	0.	200	1.	300	1.	400	1.
500	1.	600	2.	700	3.	800	4.	900	5.
1000	6.	1050	8.	1100	8.	1110	9.	1120	10.
1130	12.	1131	12.	1132	13.	1133	13.	1134	13.
1135	14.	1136	14.	1137	15.	1138	16.	1139	16.
1140	17.	1141	17.	1142	18.	1143	19.	1144	19.
1145	20.	1146	20.	1147	21.	1148	23.	1149	27.
1150	33.	1151	45.	1152	67.	1153	76.	1154	78.
1155	77.	1156	72.	1157	67.	1158	56.	1159	40.
1160	30.	1161	19.	1162	13.	1163	12.	1164	11.
1165	11.	1166	10.	1167	10.	1168	10.	1169	10.
1170	10.	1171	10.	1172	9.	1173	9.	1174	9.
1175	8.	1176	8.	1177	8.	1178	8.	1179	7.
1180	7.	1181	7.	1182	7.	1183	7.	1184	7.
1185	7.	1186	7.	1187	7.	1188	7.	1189	7.
1190	7.	1191	7.	1192	7.	1193	7.	1194	7.
1195	7.	1196	6.	1197	6.	1198	6.	1199	6.
1200	6.	1201	6.	1202	6.	1203	6.	1204	6.
1205	6.	1206	6.	1207	6.	1208	6.	1209	6.
1210	6.	1211	6.	1212	6.	1213	6.	1214	6.
1215	5.	1216	5.	1217	5.	1218	5.	1219	5.
1220	5.	1221	5.	1222	5.	1223	5.	1224	5.
1225	5.	1226	5.	1227	5.	1228	5.	1229	5.
1230	5.	1231	5.	1232	5.	1233	5.	1234	5.
1235	4.	1236	4.	1237	4.	1238	4.	1239	4.
1240	4.	1241	4.	1242	4.	1243	4.	1244	4.
1245	4.	1246	4.	1247	4.	1248	4.	1249	4.
1250	4.	1251	4.	1252	4.	1253	4.	1254	4.
1255	4.	1256	4.	1257	4.	1258	4.	1259	4.
1260	4.	1261	4.	1262	4.	1263	4.	1264	4.
1265	3.	1266	3.	1267	3.	1268	3.	1269	3.
1270	3.	1271	3.	1272	3.	1273	3.	1274	3.
1275	3.	1276	3.	1277	3.	1278	3.	1279	3.
1280	3.	1281	3.	1282	3.	1283	3.	1284	3.
1285	3.	1286	3.	1287	3.	1288	3.	1289	3.
1290	3.	1291	3.	1292	3.	1293	3.	1294	3.
1295	3.	1296	3.	1297	3.	1298	3.	1299	3.
1300	3.	1310	2.	1320	2.	1330	2.	1340	2.
1350	1.	1360	1.	1370	1.	1380	1.	1390	1.
1400	1.	1420	1.	1440	1.	1460	0.	1500	0.

Total Runoff = 6.968 Acre-Ft.
Peak Q = 78 CFS
Time to Peak Q = 1154 Minutes

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY
POST-DEV COND 50 YR Q AT SUMP PT IN BRAMLEY WY

HYDROGRAPH AT 3679 14C STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	0.	200	1.	300	1.	400	1.
500	2.	600	2.	700	3.	800	4.	900	5.
1000	7.	1050	9.	1100	8.	1110	9.	1120	10.
1130	12.	1131	12.	1132	13.	1133	13.	1134	13.
1135	13.	1136	14.	1137	14.	1138	15.	1139	15.
1140	16.	1141	17.	1142	17.	1143	18.	1144	18.
1145	19.	1146	20.	1147	21.	1148	22.	1149	25.
1150	29.	1151	37.	1152	52.	1153	57.	1154	58.
1155	58.	1156	57.	1157	57.	1158	55.	1159	54.
1160	52.	1161	48.	1162	43.	1163	34.	1164	20.
1165	14.	1166	12.	1167	11.	1168	11.	1169	11.
1170	11.	1171	10.	1172	10.	1173	10.	1174	10.
1175	9.	1176	9.	1177	9.	1178	9.	1179	9.
1180	8.	1181	8.	1182	8.	1183	8.	1184	8.
1185	8.	1186	8.	1187	8.	1188	8.	1189	8.
1190	8.	1191	8.	1192	7.	1193	7.	1194	7.
1195	7.	1196	7.	1197	7.	1198	7.	1199	7.
1200	7.	1201	7.	1202	7.	1203	7.	1204	7.
1205	7.	1206	7.	1207	7.	1208	7.	1209	7.
1210	7.	1211	6.	1212	6.	1213	6.	1214	6.
1215	6.	1216	6.	1217	6.	1218	6.	1219	6.
1220	5.	1221	5.	1222	5.	1223	5.	1224	5.
1225	5.	1226	5.	1227	5.	1228	5.	1229	5.
1230	5.	1231	5.	1232	5.	1233	5.	1234	5.
1235	5.	1236	5.	1237	5.	1238	5.	1239	5.
1240	5.	1241	5.	1242	5.	1243	5.	1244	5.
1245	5.	1246	5.	1247	5.	1248	5.	1249	5.
1250	5.	1251	5.	1252	5.	1253	5.	1254	5.
1255	5.	1256	5.	1257	5.	1258	5.	1259	5.
1260	5.	1261	4.	1262	4.	1263	4.	1264	4.
1265	4.	1266	4.	1267	4.	1268	4.	1269	3.
1270	3.	1271	3.	1272	3.	1273	3.	1274	3.
1275	3.	1276	3.	1277	3.	1278	3.	1279	3.
1280	3.	1281	3.	1282	3.	1283	3.	1284	3.
1285	3.	1286	3.	1287	3.	1288	3.	1289	3.
1290	3.	1291	3.	1292	3.	1293	3.	1294	3.
1295	3.	1296	3.	1297	3.	1298	3.	1299	3.
1300	3.	1310	2.	1320	2.	1330	2.	1340	2.
1350	1.	1360	1.	1370	1.	1380	1.	1390	1.
1400	1.	1420	0.	1440	0.	1460	0.	1500	0.

Total Runoff = 7.337 Acre-Ft.
Peak Q = 58 CFS
Time to Peak Q = 1154 Minutes

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY
POST-DEV COND 50 YR Q AT EX DESILTING BASIN ABOVE INVERNESS

HYDROGRAPH AT 3679 16C STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	0.	200	1.	300	1.	400	1.
500	2.	600	3.	700	3.	800	5.	900	6.
1000	7.	1050	9.	1100	9.	1110	10.	1120	11.
1130	13.	1131	13.	1132	14.	1133	14.	1134	14.
1135	14.	1136	15.	1137	15.	1138	16.	1139	17.
1140	17.	1141	18.	1142	18.	1143	19.	1144	20.
1145	20.	1146	21.	1147	22.	1148	23.	1149	26.
1150	30.	1151	38.	1152	53.	1153	64.	1154	66.
1155	66.	1156	63.	1157	59.	1158	57.	1159	56.
1160	54.	1161	51.	1162	46.	1163	39.	1164	27.
1165	18.	1166	14.	1167	13.	1168	12.	1169	12.
1170	12.	1171	12.	1172	11.	1173	11.	1174	10.
1175	10.	1176	10.	1177	10.	1178	9.	1179	9.
1180	9.	1181	9.	1182	9.	1183	8.	1184	8.
1185	8.	1186	8.	1187	8.	1188	8.	1189	8.
1190	8.	1191	8.	1192	8.	1193	8.	1194	8.
1195	8.	1196	8.	1197	7.	1198	7.	1199	7.
1200	7.	1201	7.	1202	7.	1203	7.	1204	7.
1205	7.	1206	7.	1207	7.	1208	7.	1209	7.
1210	7.	1211	7.	1212	7.	1213	7.	1214	6.
1215	6.	1216	6.	1217	6.	1218	6.	1219	6.
1220	6.	1221	6.	1222	6.	1223	6.	1224	6.
1225	6.	1226	6.	1227	6.	1228	6.	1229	6.
1230	6.	1231	5.	1232	5.	1233	5.	1234	5.
1235	5.	1236	5.	1237	5.	1238	5.	1239	5.
1240	5.	1241	5.	1242	5.	1243	5.	1244	5.
1245	5.	1246	5.	1247	5.	1248	5.	1249	5.
1250	5.	1251	5.	1252	5.	1253	5.	1254	5.
1255	5.	1256	5.	1257	5.	1258	5.	1259	5.
1260	5.	1261	5.	1262	5.	1263	4.	1264	4.
1265	4.	1266	4.	1267	4.	1268	4.	1269	4.
1270	4.	1271	4.	1272	3.	1273	3.	1274	3.
1275	3.	1276	3.	1277	3.	1278	3.	1279	3.
1280	3.	1281	3.	1282	3.	1283	3.	1284	3.
1285	3.	1286	3.	1287	3.	1288	3.	1289	3.
1290	3.	1291	3.	1292	3.	1293	3.	1294	3.
1295	3.	1296	3.	1297	3.	1298	3.	1299	3.
1300	3.	1310	2.	1320	2.	1330	2.	1340	2.
1350	1.	1360	1.	1370	1.	1380	1.	1390	1.
1400	1.	1420	0.	1440	0.	1460	0.	1500	0.

Total Runoff = 7.996 Acre-Ft.
Peak Q = 66 CFS
Time to Peak Q = 1154 Minutes

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY
POST-DEV COND 50 YR Q IN INVERNESS AT CORONA FROM NORTH/WEST
HYDROGRAPH AT 3679 20C STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	0.	200	1.	300	1.	400	2.
500	2.	600	3.	700	4.	800	6.	900	7.
1000	9.	1050	12.	1100	12.	1110	12.	1120	14.
1130	16.	1131	17.	1132	17.	1133	18.	1134	18.
1135	19.	1136	20.	1137	20.	1138	21.	1139	22.
1140	22.	1141	23.	1142	24.	1143	25.	1144	26.
1145	26.	1146	27.	1147	28.	1148	30.	1149	33.
1150	39.	1151	49.	1152	68.	1153	85.	1154	95.
1155	96.	1156	91.	1157	80.	1158	68.	1159	63.
1160	60.	1161	57.	1162	54.	1163	49.	1164	42.
1165	32.	1166	24.	1167	19.	1168	17.	1169	16.
1170	15.	1171	15.	1172	14.	1173	14.	1174	13.
1175	13.	1176	13.	1177	12.	1178	12.	1179	12.
1180	12.	1181	12.	1182	11.	1183	11.	1184	11.
1185	11.	1186	11.	1187	11.	1188	11.	1189	11.
1190	11.	1191	11.	1192	10.	1193	10.	1194	10.
1195	10.	1196	10.	1197	10.	1198	9.	1199	9.
1200	9.	1201	9.	1202	9.	1203	9.	1204	9.
1205	9.	1206	9.	1207	9.	1208	9.	1209	9.
1210	9.	1211	9.	1212	9.	1213	9.	1214	8.
1215	8.	1216	8.	1217	8.	1218	8.	1219	8.
1220	8.	1221	7.	1222	7.	1223	7.	1224	7.
1225	7.	1226	7.	1227	7.	1228	7.	1229	7.
1230	7.	1231	7.	1232	7.	1233	7.	1234	7.
1235	7.	1236	7.	1237	7.	1238	6.	1239	6.
1240	6.	1241	6.	1242	6.	1243	6.	1244	6.
1245	6.	1246	6.	1247	6.	1248	6.	1249	6.
1250	6.	1251	6.	1252	6.	1253	6.	1254	6.
1255	6.	1256	6.	1257	6.	1258	6.	1259	6.
1260	6.	1261	6.	1262	6.	1263	6.	1264	6.
1265	5.	1266	5.	1267	5.	1268	5.	1269	5.
1270	5.	1271	5.	1272	5.	1273	4.	1274	4.
1275	4.	1276	4.	1277	4.	1278	4.	1279	4.
1280	4.	1281	4.	1282	4.	1283	4.	1284	4.
1285	4.	1286	4.	1287	4.	1288	4.	1289	4.
1290	4.	1291	4.	1292	4.	1293	4.	1294	4.
1295	4.	1296	4.	1297	4.	1298	4.	1299	4.
1300	4.	1310	3.	1320	3.	1330	3.	1340	3.
1350	2.	1360	1.	1370	1.	1380	1.	1390	1.
1400	1.	1420	1.	1440	1.	1460	0.	1500	0.

Total Runoff = 10.105 Acre-Ft.
Peak Q = 96 CFS
Time to Peak Q = 1155 Minutes

8-20-2001 SITE LICENSEE: SPINDLER ENGINEERING

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY
EX/POST-DEV COND 50 YR Q AT INVERNESS & ST KATHERINE
HYDROGRAPH AT 3679 21D STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	0.	200	0.	300	1.	400	1.
500	1.	600	2.	700	3.	800	4.	900	5.
1000	6.	1050	8.	1100	8.	1110	8.	1120	10.
1130	11.	1131	12.	1132	12.	1133	12.	1134	13.
1135	13.	1136	13.	1137	14.	1138	14.	1139	15.
1140	15.	1141	16.	1142	17.	1143	17.	1144	18.
1145	18.	1146	19.	1147	20.	1148	21.	1149	24.
1150	28.	1151	36.	1152	50.	1153	56.	1154	57.
1155	57.	1156	56.	1157	55.	1158	54.	1159	53.
1160	51.	1161	47.	1162	42.	1163	33.	1164	19.
1165	13.	1166	11.	1167	11.	1168	10.	1169	10.
1170	10.	1171	10.	1172	9.	1173	9.	1174	9.
1175	9.	1176	9.	1177	8.	1178	8.	1179	8.
1180	8.	1181	7.	1182	7.	1183	7.	1184	7.
1185	7.	1186	7.	1187	7.	1188	7.	1189	7.
1190	7.	1191	7.	1192	7.	1193	7.	1194	7.
1195	7.	1196	6.	1197	6.	1198	6.	1199	6.
1200	6.	1201	6.	1202	6.	1203	6.	1204	6.
1205	6.	1206	6.	1207	6.	1208	6.	1209	6.
1210	6.	1211	6.	1212	6.	1213	6.	1214	6.
1215	5.	1216	5.	1217	5.	1218	5.	1219	5.
1220	5.	1221	5.	1222	5.	1223	5.	1224	5.
1225	5.	1226	5.	1227	5.	1228	5.	1229	5.
1230	5.	1231	5.	1232	5.	1233	4.	1234	4.
1235	4.	1236	4.	1237	4.	1238	4.	1239	4.
1240	4.	1241	4.	1242	4.	1243	4.	1244	4.
1245	4.	1246	4.	1247	4.	1248	4.	1249	4.
1250	4.	1251	4.	1252	4.	1253	4.	1254	4.
1255	4.	1256	4.	1257	4.	1258	4.	1259	4.
1260	4.	1261	4.	1262	4.	1263	4.	1264	3.
1265	3.	1266	3.	1267	3.	1268	3.	1269	3.
1270	3.	1271	3.	1272	3.	1273	3.	1274	3.
1275	3.	1276	3.	1277	3.	1278	3.	1279	3.
1280	3.	1281	3.	1282	3.	1283	3.	1284	3.
1285	3.	1286	3.	1287	3.	1288	3.	1289	3.
1290	3.	1291	3.	1292	3.	1293	3.	1294	3.
1295	3.	1296	3.	1297	3.	1298	3.	1299	3.
1300	3.	1310	2.	1320	2.	1330	2.	1340	2.
1350	1.	1360	1.	1370	1.	1380	1.	1390	1.
1400	1.	1420	0.	1440	0.	1460	0.	1500	0.

Total Runoff = 6.725 Acre-Ft.
Peak Q = 57 CFS
Time to Peak Q = 1154 Minutes

8-20-2001 SITE LICENSEE: SPINDLER ENGINEERING

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY
POST-DEV COND 50 YR Q IN INVERNESS AT CORONA FROM SOUTH/EAST
HYDROGRAPH AT 3679 23D STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	0.	200	1.	300	1.	400	1.
500	2.	600	3.	700	4.	800	5.	900	6.
1000	8.	1050	10.	1100	10.	1110	11.	1120	12.
1130	14.	1131	15.	1132	15.	1133	15.	1134	16.
1135	16.	1136	17.	1137	17.	1138	18.	1139	18.
1140	19.	1141	20.	1142	21.	1143	21.	1144	22.
1145	23.	1146	24.	1147	25.	1148	26.	1149	28.
1150	31.	1151	38.	1152	49.	1153	62.	1154	75.
1155	80.	1156	81.	1157	76.	1158	68.	1159	62.
1160	59.	1161	57.	1162	54.	1163	51.	1164	45.
1165	37.	1166	29.	1167	23.	1168	19.	1169	16.
1170	15.	1171	14.	1172	14.	1173	13.	1174	13.
1175	12.	1176	12.	1177	12.	1178	11.	1179	11.
1180	11.	1181	11.	1182	10.	1183	10.	1184	10.
1185	10.	1186	10.	1187	10.	1188	10.	1189	10.
1190	9.	1191	9.	1192	9.	1193	9.	1194	9.
1195	9.	1196	9.	1197	9.	1198	9.	1199	9.
1200	8.	1201	8.	1202	8.	1203	8.	1204	8.
1205	8.	1206	8.	1207	8.	1208	8.	1209	8.
1210	8.	1211	8.	1212	8.	1213	8.	1214	8.
1215	7.	1216	7.	1217	7.	1218	7.	1219	7.
1220	7.	1221	7.	1222	7.	1223	7.	1224	6.
1225	6.	1226	6.	1227	6.	1228	6.	1229	6.
1230	6.	1231	6.	1232	6.	1233	6.	1234	6.
1235	6.	1236	6.	1237	6.	1238	6.	1239	6.
1240	6.	1241	6.	1242	6.	1243	6.	1244	6.
1245	5.	1246	5.	1247	5.	1248	5.	1249	5.
1250	5.	1251	5.	1252	5.	1253	5.	1254	5.
1255	5.	1256	5.	1257	5.	1258	5.	1259	5.
1260	5.	1261	5.	1262	5.	1263	5.	1264	5.
1265	5.	1266	5.	1267	5.	1268	5.	1269	4.
1270	4.	1271	4.	1272	4.	1273	4.	1274	4.
1275	4.	1276	4.	1277	4.	1278	4.	1279	4.
1280	4.	1281	4.	1282	4.	1283	4.	1284	4.
1285	4.	1286	4.	1287	4.	1288	4.	1289	4.
1290	4.	1291	4.	1292	4.	1293	4.	1294	4.
1295	4.	1296	4.	1297	4.	1298	4.	1299	4.
1300	4.	1310	3.	1320	2.	1330	2.	1340	2.
1350	2.	1360	1.	1370	1.	1380	1.	1390	1.
1400	1.	1420	1.	1440	1.	1460	0.	1500	0.

Total Runoff = 8.945 Acre-Ft.
Peak Q = 81 CFS
Time to Peak Q = 1156 Minutes

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY
POST-DEV CONDITION 50 YR TOTAL Q AT INVERNESS & CORONA
HYDROGRAPH AT 3679 26C STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	1.	200	1.	300	2.	400	3.
500	4.	600	6.	700	8.	800	11.	900	14.
1000	17.	1050	23.	1100	23.	1110	24.	1120	28.
1130	32.	1131	33.	1132	33.	1133	34.	1134	35.
1135	36.	1136	38.	1137	39.	1138	40.	1139	41.
1140	43.	1141	44.	1142	46.	1143	47.	1144	49.
1145	51.	1146	53.	1147	55.	1148	57.	1149	63.
1150	72.	1151	90.	1152	122.	1153	153.	1154	175.
1155	183.	1156	178.	1157	160.	1158	140.	1159	128.
1160	121.	1161	116.	1162	110.	1163	102.	1164	90.
1165	73.	1166	56.	1167	45.	1168	38.	1169	34.
1170	32.	1171	30.	1172	29.	1173	28.	1174	27.
1175	26.	1176	25.	1177	25.	1178	24.	1179	24.
1180	23.	1181	23.	1182	22.	1183	22.	1184	22.
1185	21.	1186	21.	1187	21.	1188	21.	1189	21.
1190	21.	1191	21.	1192	20.	1193	20.	1194	20.
1195	19.	1196	19.	1197	19.	1198	19.	1199	18.
1200	18.	1201	18.	1202	18.	1203	18.	1204	18.
1205	18.	1206	17.	1207	17.	1208	17.	1209	17.
1210	17.	1211	17.	1212	17.	1213	17.	1214	17.
1215	16.	1216	16.	1217	16.	1218	15.	1219	15.
1220	15.	1221	15.	1222	14.	1223	14.	1224	14.
1225	14.	1226	14.	1227	14.	1228	14.	1229	14.
1230	14.	1231	14.	1232	14.	1233	13.	1234	13.
1235	13.	1236	13.	1237	13.	1238	13.	1239	13.
1240	12.	1241	12.	1242	12.	1243	12.	1244	12.
1245	12.	1246	12.	1247	12.	1248	12.	1249	12.
1250	12.	1251	12.	1252	12.	1253	12.	1254	12.
1255	12.	1256	12.	1257	12.	1258	12.	1259	12.
1260	12.	1261	12.	1262	12.	1263	11.	1264	11.
1265	11.	1266	10.	1267	10.	1268	10.	1269	10.
1270	9.	1271	9.	1272	9.	1273	9.	1274	9.
1275	8.	1276	8.	1277	8.	1278	8.	1279	8.
1280	8.	1281	8.	1282	8.	1283	8.	1284	8.
1285	8.	1286	8.	1287	8.	1288	8.	1289	8.
1290	8.	1291	8.	1292	8.	1293	8.	1294	8.
1295	8.	1296	8.	1297	8.	1298	8.	1299	8.
1300	8.	1310	6.	1320	5.	1330	5.	1340	5.
1350	3.	1360	2.	1370	2.	1380	2.	1390	2.
1400	2.	1420	1.	1440	1.	1460	1.	1500	1.

Total Runoff = 19.572 Acre-Ft.
Peak Q = 183 CFS
Time to Peak Q = 1155 Minutes

#3679.00

EX. CONDITIONS (EX. STREET INLETS)

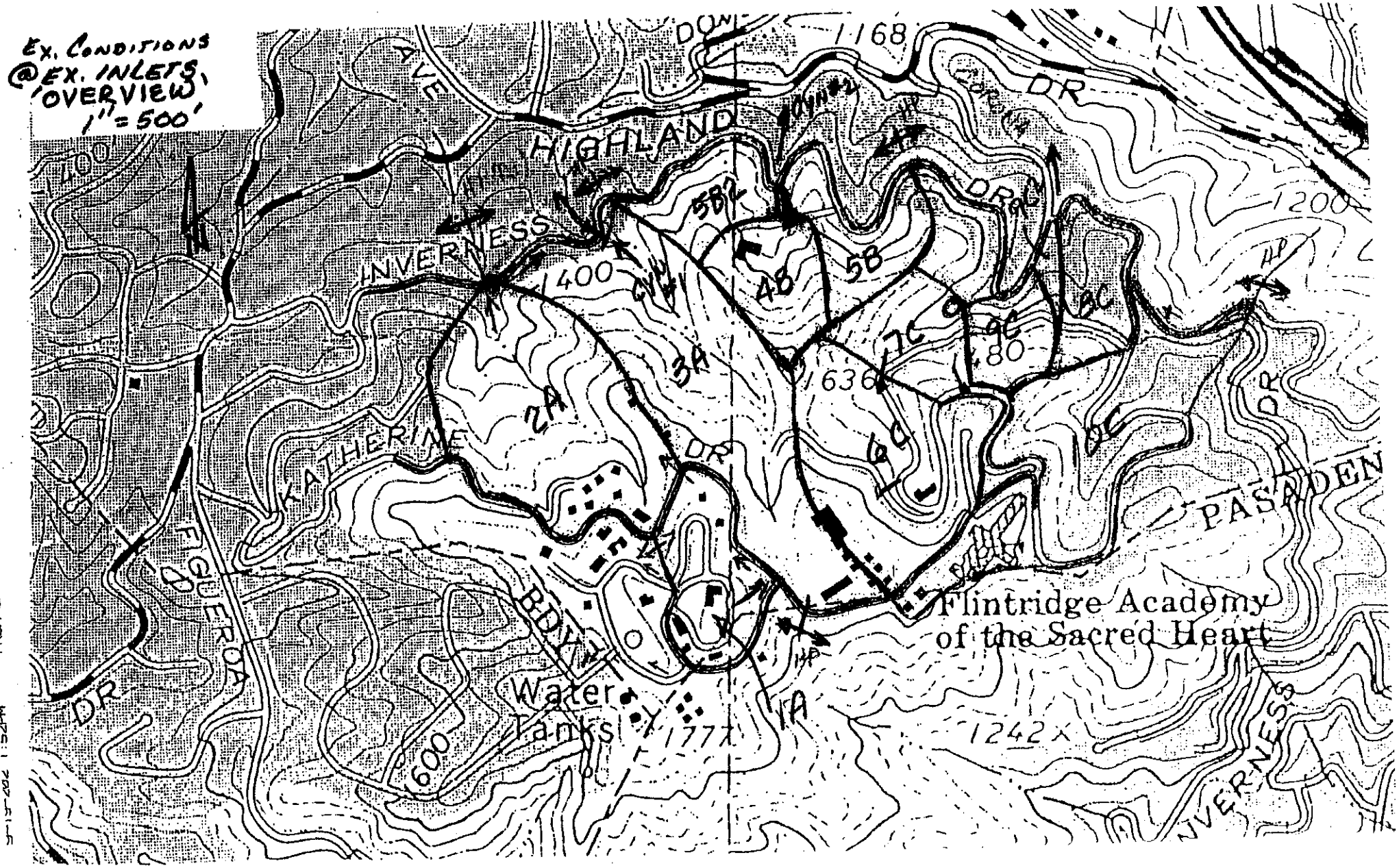
DA (MAP)		MORA DA	MORA AREA
1A	=	1A	11 Ac
2A	=	4A	23 Ac
3A	=	7A	31 Ac
4B	=	8B	8 Ac
5B	=	10B	6 Ac
5B2	=	11B	7 Ac
6C	=	13C	19 Ac
7C	=	15C	7 Ac
9C	=	19C	6 Ac
10C	=	20D	23 Ac
8C	=	21D	7 Ac
9C2	=	22D	2 Ac

#3679.00

Q_{50} @ Cyn #1 = 116 CFS

Q_{50} @ Cyn #2 = 77 CFS

Q_{50} @ INVERNESS/CORONA = 186CFS


EX. CONDITIONS
@EX. INLETS,
'OVERVIEW'
1"=500'
HIGHLAND
INVERNESS
KATHERINE
FIGUEROA
DR
AVE
1168
1200
1400
1242
1772
1636
Water
Tanks
Flintridge Academy
of the Sacred Heart
PASADEN
5B2
5B
4B
3A
2A
1A
7C
8C
9C
6C
60

1-20-2001 SITE LICENSEE: SPINDLER ENGINEERING PAGE 1

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT PROG P0601A

MODIFIED RATIONAL METHOD HYDROLOGY

KUDGRAVE EX CONDITION 50 YR STORM (WITH EX STREETS) 8/15/01 STORM DAY 4

LOCATION		SUBAREA AREA	SUBAREA Q	TOTAL AREA	TOTAL Q	CONV TYPE	CONV LNGTH	CONV SLOPE	CONV SIZE	CONV Z	CONTROL Q	SOIL NAME	TC	RAIN ZONE	PCT IMPV
3679	1A	11.	38.	11.	38.	0	0.	0.00000	0.00	0.00	0.	68	8	L50	0.22
3679	2A	0.	0.	11.	38.	3	850.	0.10000	0.00	0.00	0.	68	99	L50	0.00
3679	3A	0.	0.	11.	37.	1	1400.	0.12500	0.00	0.00	0.	68	99	L50	0.00
3679	4A	23.	61.	34.	82.	0	0.	0.00000	0.00	0.00	0.	68	11	L50	0.10

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* CONFLUENCE Q'S *

* 3679 5A TA 1159 QA 82. QAF 41. QF 41. 3679 5F TF 1159 QF 41. QFA 41. QA 82. *

* 3679 5AF TAF 1159 QAF 41. QA 82. QF 41. *

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LOCATION		SUBAREA AREA	SUBAREA Q	TOTAL AREA	TOTAL Q	CONV TYPE	CONV LNGTH	CONV SLOPE	CONV SIZE	CONV Z	CONTROL Q	SOIL NAME	TC	RAIN ZONE	PCT IMPV
3679	5AF	0.	41.	34.	41.	0	0.	0.00000	0.00	0.00	50.	68	0	L50	0.00
3679	6A	0.	0.	34.	41.	3	550.	0.06000	0.00	0.00	0.	68	99	L50	0.00
3679	7A	31.	82.	65.	116.	0	0.	0.00000	0.00	0.00	0.	68	11	L50	0.10
3679	8B	8.	30.	8.	30.	4	150.	0.25000	2.00	0.00	0.	68	7	L50	0.22
3679	9B	0.	0.	8.	30.	0	0.	0.00000	0.00	0.00	0.	68	99	L50	0.00
3679	10B	6.	21.	14.	51.	0	0.	0.00000	0.00	0.00	0.	68	7	L50	0.00
3679	11B	7.	25.	21.	77.	0	0.	0.00000	0.00	0.00	0.	68	7	L50	0.05
3679	12B	0.	0.	21.	77.	0	0.	0.00000	0.00	0.00	0.	68	99	L50	0.00
3679	13C	19.	55.	19.	55.	0	0.	0.00000	0.00	0.00	0.	68	10	L50	0.15
3679	14C	0.	0.	19.	55.	1	500.	0.15000	0.00	0.00	0.	68	99	L50	0.00
3679	15C	7.	28.	26.	79.	0	0.	0.00000	0.00	0.00	0.	68	6	L50	0.00
3679	16C	0.	0.	26.	79.	4	250.	0.05000	2.00	0.00	0.	68	99	L50	0.00
3679	17C	0.	0.	26.	79.	0	0.	0.00000	0.00	0.00	0.	68	99	L50	0.00
3679	18C	0.	0.	26.	79.	4	400.	0.06000	2.25	0.00	0.	68	99	L50	0.00
3679	19C	6.	27.	32.	100.	0	0.	0.00000	0.00	0.00	0.	68	5	L50	0.05
3679	20D	23.	57.	23.	57.	3	1050.	0.18000	0.00	0.00	0.	68	12	L50	0.10
3679	21D	7.	29.	30.	79.	3	150.	0.10000	0.00	0.00	0.	68	6	L50	0.20
3679	22D	2.	9.	32.	86.	0	0.	0.00000	0.00	0.00	0.	68	5	L50	0.10

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* CONFLUENCE Q'S *

* 3679 23C TC 1155 QC 100. QCD 186. QD 86. 3679 23D TD 1155 QD 86. QDC 186. QC 100. *

* 3679 23CD TCD 1155 QCD 186. QC 100. QD 86. *

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LOCATION		SUBAREA AREA	SUBAREA Q	TOTAL AREA	TOTAL Q	CONV TYPE	CONV LNGTH	CONV SLOPE	CONV SIZE	CONV Z	CONTROL Q	SOIL NAME	TC	RAIN ZONE	PCT IMPV
3679	23CD	32.	86.	64.	186.	0	0.	0.00000	0.00	0.00	0.	68	0	L50	0.00
3679	24C	0.	0.	64.	186.	0	0.	0.00000	0.00	0.00	0.	68	99	L50	0.00

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY
EX COND 50 YR Q AT SUMP PT IN ST KATHERINE DR

HYDROGRAPH AT 3679 2A STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	0.	200	0.	300	1.	400	1.
500	1.	600	1.	700	2.	800	2.	900	3.
1000	4.	1050	5.	1100	4.	1110	5.	1120	6.
1130	6.	1131	7.	1132	7.	1133	7.	1134	7.
1135	7.	1136	8.	1137	8.	1138	8.	1139	9.
1140	9.	1141	9.	1142	9.	1143	10.	1144	10.
1145	10.	1146	11.	1147	11.	1148	12.	1149	14.
1150	17.	1151	23.	1152	33.	1153	37.	1154	38.
1155	38.	1156	36.	1157	33.	1158	30.	1159	23.
1160	12.	1161	8.	1162	7.	1163	6.	1164	6.
1165	6.	1166	6.	1167	6.	1168	5.	1169	5.
1170	5.	1171	5.	1172	5.	1173	5.	1174	5.
1175	5.	1176	5.	1177	4.	1178	4.	1179	4.
1180	4.	1181	4.	1182	4.	1183	4.	1184	4.
1185	4.	1186	4.	1187	4.	1188	4.	1189	4.
1190	4.	1191	4.	1192	4.	1193	4.	1194	4.
1195	4.	1196	4.	1197	4.	1198	4.	1199	4.
1200	4.	1201	4.	1202	4.	1203	4.	1204	4.
1205	4.	1206	4.	1207	4.	1208	4.	1209	4.
1210	4.	1211	3.	1212	3.	1213	3.	1214	3.
1215	3.	1216	3.	1217	3.	1218	3.	1219	3.
1220	3.	1221	3.	1222	3.	1223	3.	1224	3.
1225	3.	1226	3.	1227	3.	1228	3.	1229	3.
1230	3.	1231	3.	1232	3.	1233	3.	1234	3.
1235	3.	1236	3.	1237	3.	1238	3.	1239	3.
1240	3.	1241	3.	1242	3.	1243	3.	1244	3.
1245	3.	1246	3.	1247	3.	1248	3.	1249	3.
1250	3.	1251	3.	1252	3.	1253	3.	1254	3.
1255	3.	1256	3.	1257	3.	1258	3.	1259	3.
1260	3.	1261	2.	1262	2.	1263	2.	1264	2.
1265	2.	1266	2.	1267	2.	1268	2.	1269	2.
1270	2.	1271	2.	1272	2.	1273	2.	1274	2.
1275	2.	1276	2.	1277	2.	1278	2.	1279	2.
1280	2.	1281	2.	1282	2.	1283	2.	1284	2.
1285	2.	1286	2.	1287	2.	1288	2.	1289	2.
1290	2.	1291	2.	1292	2.	1293	2.	1294	2.
1295	2.	1296	2.	1297	2.	1298	2.	1299	2.
1300	2.	1310	1.	1320	1.	1330	1.	1340	1.
1350	1.	1360	1.	1370	1.	1380	1.	1390	1.
1400	1.	1420	0.	1440	0.	1460	0.	1500	0.

Total Runoff = 4.099 Acre-Ft.
Peak Q = 38 CFS
Time to Peak Q = 1154 Minutes

1145	26.	1146	27.	1147	28.	1148	29.	1149	33.
1150	37.	1151	47.	1152	63.	1153	69.	1154	71.
1155	72.	1156	74.	1157	77.	1158	80.	1159	82.
1160	81.	1161	77.	1162	67.	1163	50.	1164	42.
1165	37.	1166	33.	1167	30.	1168	27.	1169	24.
1170	22.	1171	20.	1172	19.	1173	18.	1174	17.
1175	16.	1176	16.	1177	15.	1178	14.	1179	14.
1180	13.	1181	13.	1182	13.	1183	13.	1184	12.
1185	12.	1186	12.	1187	12.	1188	12.	1189	12.
1190	12.	1191	11.	1192	11.	1193	11.	1194	11.
1195	11.	1196	11.	1197	11.	1198	10.	1199	10.
1200	10.	1201	10.	1202	10.	1203	10.	1204	10.
1205	10.	1206	10.	1207	10.	1208	10.	1209	10.
1210	10.	1211	9.	1212	9.	1213	9.	1214	9.
1215	9.	1216	9.	1217	9.	1218	9.	1219	8.
1220	8.	1221	8.	1222	8.	1223	8.	1224	8.
1225	8.	1226	8.	1227	8.	1228	8.	1229	8.
1230	8.	1231	8.	1232	8.	1233	7.	1234	7.
1235	7.	1236	7.	1237	7.	1238	7.	1239	7.
1240	7.	1241	7.	1242	7.	1243	7.	1244	7.
1245	7.	1246	7.	1247	7.	1248	7.	1249	7.
1250	7.	1251	7.	1252	7.	1253	7.	1254	7.
1255	7.	1256	7.	1257	7.	1258	7.	1259	7.
1260	7.	1261	6.	1262	6.	1263	6.	1264	6.
1265	6.	1266	6.	1267	6.	1268	6.	1269	5.
1270	5.	1271	5.	1272	5.	1273	5.	1274	5.
1275	5.	1276	5.	1277	5.	1278	5.	1279	5.
1280	5.	1281	5.	1282	5.	1283	5.	1284	5.
1285	5.	1286	5.	1287	5.	1288	5.	1289	5.
1290	5.	1291	5.	1292	5.	1293	5.	1294	5.
1295	5.	1296	5.	1297	5.	1298	5.	1299	5.
1300	5.	1310	3.	1320	3.	1330	3.	1340	3.
1350	2.	1360	2.	1370	2.	1380	1.	1390	1.
1400	1.	1420	1.	1440	1.	1460	0.	1500	0.

Total Runoff = 10.825 Acre-Ft.
Peak Q = 82 CFS
Time to Peak Q = 1159 Minutes

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY
EX COND 50 YR STORM Q AT INVERNESS BEFORE 50/50 SPLIT
HYDROGRAPH AT 3679 4A STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	1.	200	1.	300	1.	400	2.
500	2.	600	3.	700	5.	800	6.	900	8.
1000	9.	1050	12.	1100	12.	1110	13.	1120	15.
1130	17.	1131	17.	1132	18.	1133	18.	1134	18.
1135	19.	1136	19.	1137	20.	1138	21.	1139	21.
1140	22.	1141	23.	1142	23.	1143	24.	1144	25.
1145	26.	1146	27.	1147	28.	1148	29.	1149	33.
1150	37.	1151	47.	1152	63.	1153	69.	1154	71.
1155	72.	1156	74.	1157	77.	1158	80.	1159	82.
1160	81.	1161	77.	1162	67.	1163	50.	1164	42.
1165	37.	1166	33.	1167	30.	1168	27.	1169	24.
1170	22.	1171	20.	1172	19.	1173	18.	1174	17.
1175	16.	1176	16.	1177	15.	1178	14.	1179	14.
1180	13.	1181	13.	1182	13.	1183	13.	1184	12.
1185	12.	1186	12.	1187	12.	1188	12.	1189	12.
1190	12.	1191	11.	1192	11.	1193	11.	1194	11.
1195	11.	1196	11.	1197	11.	1198	10.	1199	10.
1200	10.	1201	10.	1202	10.	1203	10.	1204	10.
1205	10.	1206	10.	1207	10.	1208	10.	1209	10.
1210	10.	1211	9.	1212	9.	1213	9.	1214	9.
1215	9.	1216	9.	1217	9.	1218	9.	1219	8.
1220	8.	1221	8.	1222	8.	1223	8.	1224	8.
1225	8.	1226	8.	1227	8.	1228	8.	1229	8.
1230	8.	1231	8.	1232	8.	1233	7.	1234	7.
1235	7.	1236	7.	1237	7.	1238	7.	1239	7.
1240	7.	1241	7.	1242	7.	1243	7.	1244	7.
1245	7.	1246	7.	1247	7.	1248	7.	1249	7.
1250	7.	1251	7.	1252	7.	1253	7.	1254	7.
1255	7.	1256	7.	1257	7.	1258	7.	1259	7.
1260	7.	1261	6.	1262	6.	1263	6.	1264	6.
1265	6.	1266	6.	1267	6.	1268	6.	1269	5.
1270	5.	1271	5.	1272	5.	1273	5.	1274	5.
1275	5.	1276	5.	1277	5.	1278	5.	1279	5.
1280	5.	1281	5.	1282	5.	1283	5.	1284	5.
1285	5.	1286	5.	1287	5.	1288	5.	1289	5.
1290	5.	1291	5.	1292	5.	1293	5.	1294	5.
1295	5.	1296	5.	1297	5.	1298	5.	1299	5.
1300	5.	1310	3.	1320	3.	1330	3.	1340	3.
1350	2.	1360	2.	1370	2.	1380	1.	1390	1.
1400	1.	1420	1.	1440	1.	1460	0.	1500	0.

Total Runoff = 10.825 Acre-Ft.
Peak Q = 82 CFS
Time to Peak Q = 1159 Minutes

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY
EX CONDITION 50 YR Q AFTER SPLIT
HYDROGRAPH AT 3679 6A STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	0.	200	0.	300	1.	400	1.
500	1.	600	2.	700	2.	800	3.	900	4.
1000	5.	1050	6.	1100	6.	1110	7.	1120	7.
1130	8.	1131	9.	1132	9.	1133	9.	1134	9.
1135	9.	1136	10.	1137	10.	1138	10.	1139	11.
1140	11.	1141	11.	1142	12.	1143	12.	1144	12.
1145	13.	1146	13.	1147	14.	1148	15.	1149	16.
1150	19.	1151	23.	1152	31.	1153	34.	1154	36.
1155	36.	1156	37.	1157	38.	1158	40.	1159	41.
1160	40.	1161	38.	1162	34.	1163	25.	1164	21.
1165	18.	1166	16.	1167	15.	1168	13.	1169	12.
1170	11.	1171	10.	1172	10.	1173	9.	1174	9.
1175	8.	1176	8.	1177	7.	1178	7.	1179	7.
1180	7.	1181	7.	1182	6.	1183	6.	1184	6.
1185	6.	1186	6.	1187	6.	1188	6.	1189	6.
1190	6.	1191	6.	1192	6.	1193	6.	1194	5.
1195	5.	1196	5.	1197	5.	1198	5.	1199	5.
1200	5.	1201	5.	1202	5.	1203	5.	1204	5.
1205	5.	1206	5.	1207	5.	1208	5.	1209	5.
1210	5.	1211	5.	1212	5.	1213	5.	1214	5.
1215	4.	1216	4.	1217	4.	1218	4.	1219	4.
1220	4.	1221	4.	1222	4.	1223	4.	1224	4.
1225	4.	1226	4.	1227	4.	1228	4.	1229	4.
1230	4.	1231	4.	1232	4.	1233	4.	1234	4.
1235	4.	1236	4.	1237	4.	1238	4.	1239	4.
1240	3.	1241	3.	1242	3.	1243	3.	1244	3.
1245	3.	1246	3.	1247	3.	1248	3.	1249	3.
1250	3.	1251	3.	1252	3.	1253	3.	1254	3.
1255	3.	1256	3.	1257	3.	1258	3.	1259	3.
1260	3.	1261	3.	1262	3.	1263	3.	1264	3.
1265	3.	1266	3.	1267	3.	1268	3.	1269	3.
1270	3.	1271	3.	1272	3.	1273	3.	1274	3.
1275	3.	1276	3.	1277	2.	1278	2.	1279	2.
1280	2.	1281	2.	1282	2.	1283	2.	1284	2.
1285	2.	1286	2.	1287	2.	1288	2.	1289	2.
1290	2.	1291	2.	1292	2.	1293	2.	1294	2.
1295	2.	1296	2.	1297	2.	1298	2.	1299	2.
1300	2.	1310	2.	1320	2.	1330	1.	1340	1.
1350	1.	1360	1.	1370	1.	1380	1.	1390	1.
1400	1.	1420	0.	1440	0.	1460	0.	1500	0.

Total Runoff = 5.360 Acre-Ft.
Peak Q = 41 CFS
Time to Peak Q = 1159 Minutes

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY
EX COND 50 YR Q AT SUMP PT SPILL OVER TO NATURAL CANYON #1

HYDROGRAPH AT 3679 7A STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	1.	200	1.	300	2.	400	2.
500	3.	600	4.	700	6.	800	8.	900	10.
1000	13.	1050	17.	1100	16.	1110	18.	1120	20.
1130	24.	1131	24.	1132	25.	1133	25.	1134	26.
1135	26.	1136	27.	1137	28.	1138	29.	1139	30.
1140	31.	1141	33.	1142	34.	1143	35.	1144	36.
1145	37.	1146	39.	1147	40.	1148	42.	1149	47.
1150	54.	1151	68.	1152	93.	1153	106.	1154	114.
1155	116.	1156	116.	1157	115.	1158	115.	1159	113.
1160	109.	1161	101.	1162	86.	1163	62.	1164	48.
1165	40.	1166	35.	1167	32.	1168	30.	1169	28.
1170	27.	1171	25.	1172	24.	1173	23.	1174	22.
1175	21.	1176	20.	1177	19.	1178	19.	1179	18.
1180	17.	1181	17.	1182	17.	1183	16.	1184	16.
1185	16.	1186	16.	1187	16.	1188	16.	1189	16.
1190	15.	1191	15.	1192	15.	1193	15.	1194	15.
1195	14.	1196	14.	1197	14.	1198	14.	1199	14.
1200	13.	1201	13.	1202	13.	1203	13.	1204	13.
1205	13.	1206	13.	1207	13.	1208	13.	1209	13.
1210	13.	1211	13.	1212	12.	1213	12.	1214	12.
1215	12.	1216	12.	1217	11.	1218	11.	1219	11.
1220	11.	1221	11.	1222	10.	1223	10.	1224	10.
1225	10.	1226	10.	1227	10.	1228	10.	1229	10.
1230	10.	1231	10.	1232	10.	1233	10.	1234	10.
1235	10.	1236	10.	1237	9.	1238	9.	1239	9.
1240	9.	1241	9.	1242	9.	1243	9.	1244	9.
1245	9.	1246	9.	1247	9.	1248	9.	1249	9.
1250	9.	1251	9.	1252	9.	1253	9.	1254	9.
1255	9.	1256	9.	1257	9.	1258	9.	1259	9.
1260	9.	1261	8.	1262	8.	1263	8.	1264	8.
1265	8.	1266	7.	1267	7.	1268	7.	1269	7.
1270	7.	1271	6.	1272	6.	1273	6.	1274	6.
1275	6.	1276	6.	1277	6.	1278	6.	1279	6.
1280	6.	1281	6.	1282	6.	1283	6.	1284	6.
1285	6.	1286	6.	1287	6.	1288	6.	1289	6.
1290	6.	1291	6.	1292	6.	1293	6.	1294	6.
1295	6.	1296	6.	1297	6.	1298	6.	1299	6.
1300	6.	1310	4.	1320	4.	1330	4.	1340	4.
1350	2.	1360	2.	1370	2.	1380	2.	1390	2.
1400	2.	1420	1.	1440	1.	1460	0.	1500	0.

Total Runoff = 14.445 Acre-Ft.
Peak Q = 116 CFS
Time to Peak Q = 1155 Minutes

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY
EX COND 50 YR Q AT EX CB INLETS IN HAVERSTOCK RD
HYDROGRAPH AT 3679 9B STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	0.	200	0.	300	0.	400	1.
500	1.	600	1.	700	1.	800	2.	900	2.
1000	3.	1050	3.	1100	3.	1110	4.	1120	4.
1130	5.	1131	5.	1132	5.	1133	5.	1134	5.
1135	5.	1136	6.	1137	6.	1138	6.	1139	6.
1140	6.	1141	7.	1142	7.	1143	7.	1144	7.
1145	7.	1146	8.	1147	8.	1148	9.	1149	10.
1150	12.	1151	17.	1152	25.	1153	30.	1154	30.
1155	30.	1156	27.	1157	25.	1158	19.	1159	11.
1160	7.	1161	5.	1162	4.	1163	4.	1164	4.
1165	4.	1166	4.	1167	4.	1168	4.	1169	4.
1170	4.	1171	4.	1172	4.	1173	4.	1174	3.
1175	3.	1176	3.	1177	3.	1178	3.	1179	3.
1180	3.	1181	3.	1182	3.	1183	3.	1184	3.
1185	3.	1186	3.	1187	3.	1188	3.	1189	3.
1190	3.	1191	3.	1192	3.	1193	3.	1194	3.
1195	3.	1196	3.	1197	3.	1198	3.	1199	3.
1200	3.	1201	3.	1202	3.	1203	3.	1204	3.
1205	3.	1206	3.	1207	3.	1208	3.	1209	3.
1210	3.	1211	3.	1212	2.	1213	2.	1214	2.
1215	2.	1216	2.	1217	2.	1218	2.	1219	2.
1220	2.	1221	2.	1222	2.	1223	2.	1224	2.
1225	2.	1226	2.	1227	2.	1228	2.	1229	2.
1230	2.	1231	2.	1232	2.	1233	2.	1234	2.
1235	2.	1236	2.	1237	2.	1238	2.	1239	2.
1240	2.	1241	2.	1242	2.	1243	2.	1244	2.
1245	2.	1246	2.	1247	2.	1248	2.	1249	2.
1250	2.	1251	2.	1252	2.	1253	2.	1254	2.
1255	2.	1256	2.	1257	2.	1258	2.	1259	2.
1260	2.	1261	2.	1262	2.	1263	2.	1264	2.
1265	1.	1266	1.	1267	1.	1268	1.	1269	1.
1270	1.	1271	1.	1272	1.	1273	1.	1274	1.
1275	1.	1276	1.	1277	1.	1278	1.	1279	1.
1280	1.	1281	1.	1282	1.	1283	1.	1284	1.
1285	1.	1286	1.	1287	1.	1288	1.	1289	1.
1290	1.	1291	1.	1292	1.	1293	1.	1294	1.
1295	1.	1296	1.	1297	1.	1298	1.	1299	1.
1300	1.	1310	1.	1320	1.	1330	1.	1340	1.
1350	0.	1360	0.	1370	0.	1380	0.	1390	0.
1400	0.	1420	0.	1440	0.	1460	0.	1500	0.

Total Runoff = 2.871 Acre-Ft.
Peak Q = 30 CFS
Time to Peak Q = 1153 Minutes

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY
EX 50 YR Q TO SUMP PT SPILL OVER TO NATURAL CANYON #2

HYDROGRAPH AT 3679 12B STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	0.	200	1.	300	1.	400	1.
500	1.	600	2.	700	3.	800	3.	900	4.
1000	5.	1050	7.	1100	7.	1110	8.	1120	9.
1130	11.	1131	11.	1132	11.	1133	12.	1134	12.
1135	12.	1136	13.	1137	14.	1138	14.	1139	15.
1140	15.	1141	16.	1142	17.	1143	17.	1144	17.
1145	18.	1146	19.	1147	20.	1148	21.	1149	25.
1150	31.	1151	43.	1152	66.	1153	75.	1154	77.
1155	75.	1156	69.	1157	61.	1158	47.	1159	24.
1160	15.	1161	12.	1162	10.	1163	10.	1164	10.
1165	9.	1166	9.	1167	9.	1168	9.	1169	9.
1170	8.	1171	9.	1172	8.	1173	8.	1174	8.
1175	7.	1176	7.	1177	7.	1178	7.	1179	7.
1180	7.	1181	7.	1182	7.	1183	7.	1184	7.
1185	6.	1186	6.	1187	6.	1188	6.	1189	6.
1190	6.	1191	6.	1192	6.	1193	6.	1194	6.
1195	6.	1196	6.	1197	5.	1198	5.	1199	5.
1200	5.	1201	5.	1202	5.	1203	5.	1204	5.
1205	5.	1206	5.	1207	5.	1208	5.	1209	5.
1210	5.	1211	5.	1212	5.	1213	5.	1214	5.
1215	5.	1216	4.	1217	4.	1218	4.	1219	4.
1220	4.	1221	4.	1222	4.	1223	4.	1224	4.
1225	4.	1226	4.	1227	4.	1228	4.	1229	4.
1230	4.	1231	4.	1232	4.	1233	4.	1234	4.
1235	4.	1236	4.	1237	4.	1238	4.	1239	4.
1240	4.	1241	4.	1242	4.	1243	4.	1244	4.
1245	4.	1246	4.	1247	4.	1248	4.	1249	4.
1250	4.	1251	4.	1252	4.	1253	4.	1254	4.
1255	4.	1256	4.	1257	4.	1258	4.	1259	4.
1260	4.	1261	3.	1262	3.	1263	3.	1264	3.
1265	3.	1266	3.	1267	3.	1268	3.	1269	3.
1270	3.	1271	3.	1272	3.	1273	3.	1274	3.
1275	3.	1276	3.	1277	3.	1278	3.	1279	3.
1280	3.	1281	3.	1282	3.	1283	3.	1284	3.
1285	3.	1286	3.	1287	3.	1288	3.	1289	3.
1290	3.	1291	3.	1292	3.	1293	3.	1294	3.
1295	3.	1296	3.	1297	3.	1298	3.	1299	3.
1300	3.	1310	1.	1320	1.	1330	1.	1340	1.
1350	1.	1360	1.	1370	1.	1380	1.	1390	1.
1400	1.	1420	1.	1440	1.	1460	0.	1500	0.

Total Runoff = 6.160 Acre-Ft.
Peak Q = 77 CFS
Time to Peak Q = 1154 Minutes

8-20-2001 SITE LICENSEE: SPINDLER ENGINEERING

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

MODIFIED RATIONAL METHOD HYDROLOGY

EX COND 50 YR Q AT SUMP PT IN BRAMLEY WY

HYDROGRAPH AT 3679 14C STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	0.	200	0.	300	1.	400	1.
500	1.	600	2.	700	3.	800	4.	900	4.
1000	5.	1050	7.	1100	7.	1110	8.	1120	9.
1130	10.	1131	10.	1132	11.	1133	11.	1134	11.
1135	11.	1136	12.	1137	12.	1138	13.	1139	13.
1140	14.	1141	14.	1142	15.	1143	15.	1144	16.
1145	16.	1146	17.	1147	17.	1148	19.	1149	21.
1150	26.	1151	33.	1152	48.	1153	53.	1154	55.
1155	55.	1156	53.	1157	52.	1158	50.	1159	46.
1160	41.	1161	32.	1162	18.	1163	12.	1164	10.
1165	9.	1166	9.	1167	9.	1168	9.	1169	9.
1170	9.	1171	8.	1172	8.	1173	8.	1174	8.
1175	8.	1176	7.	1177	7.	1178	7.	1179	7.
1180	6.	1181	6.	1182	6.	1183	6.	1184	6.
1185	6.	1186	6.	1187	6.	1188	6.	1189	6.
1190	6.	1191	6.	1192	6.	1193	6.	1194	6.
1195	6.	1196	6.	1197	6.	1198	6.	1199	5.
1200	5.	1201	5.	1202	5.	1203	5.	1204	5.
1205	5.	1206	5.	1207	5.	1208	5.	1209	5.
1210	5.	1211	5.	1212	5.	1213	5.	1214	5.
1215	5.	1216	5.	1217	5.	1218	5.	1219	4.
1220	4.	1221	4.	1222	4.	1223	4.	1224	4.
1225	4.	1226	4.	1227	4.	1228	4.	1229	4.
1230	4.	1231	4.	1232	4.	1233	4.	1234	4.
1235	4.	1236	4.	1237	4.	1238	4.	1239	4.
1240	4.	1241	4.	1242	4.	1243	4.	1244	4.
1245	4.	1246	4.	1247	4.	1248	4.	1249	4.
1250	4.	1251	4.	1252	4.	1253	4.	1254	4.
1255	4.	1256	4.	1257	4.	1258	4.	1259	4.
1260	4.	1261	4.	1262	3.	1263	3.	1264	3.
1265	3.	1266	3.	1267	3.	1268	3.	1269	3.
1270	3.	1271	3.	1272	3.	1273	3.	1274	3.
1275	3.	1276	3.	1277	3.	1278	3.	1279	3.
1280	3.	1281	3.	1282	3.	1283	3.	1284	3.
1285	3.	1286	3.	1287	3.	1288	3.	1289	3.
1290	3.	1291	3.	1292	3.	1293	3.	1294	3.
1295	3.	1296	3.	1297	3.	1298	3.	1299	3.
1300	3.	1310	2.	1320	2.	1330	2.	1340	2.
1350	1.	1360	1.	1370	1.	1380	1.	1390	1.
1400	1.	1420	0.	1440	0.	1460	0.	1500	0.

Total Runoff = 6.054 Acre-Ft.
Peak Q = 55 CFS
Time to Peak Q = 1154 Minutes

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY
EX COND 50 YR Q AT EX DESILTING BASIN ABOVE INVERNESS

HYDROGRAPH AT 3679 16C STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	0.	200	1.	300	1.	400	1.
500	2.	600	2.	700	3.	800	4.	900	5.
1000	7.	1050	9.	1100	9.	1110	10.	1120	11.
1130	13.	1131	13.	1132	13.	1133	14.	1134	14.
1135	15.	1136	15.	1137	16.	1138	16.	1139	17.
1140	17.	1141	18.	1142	19.	1143	19.	1144	20.
1145	21.	1146	22.	1147	22.	1148	23.	1149	26.
1150	30.	1151	38.	1152	54.	1153	67.	1154	77.
1155	79.	1156	77.	1157	71.	1158	60.	1159	55.
1160	51.	1161	46.	1162	39.	1163	30.	1164	21.
1165	17.	1166	14.	1167	13.	1168	12.	1169	12.
1170	12.	1171	11.	1172	11.	1173	11.	1174	10.
1175	10.	1176	10.	1177	10.	1178	9.	1179	9.
1180	9.	1181	9.	1182	8.	1183	8.	1184	8.
1185	8.	1186	8.	1187	8.	1188	8.	1189	8.
1190	8.	1191	8.	1192	8.	1193	8.	1194	8.
1195	8.	1196	7.	1197	7.	1198	7.	1199	7.
1200	7.	1201	7.	1202	7.	1203	7.	1204	7.
1205	7.	1206	7.	1207	7.	1208	7.	1209	7.
1210	7.	1211	7.	1212	7.	1213	7.	1214	6.
1215	6.	1216	6.	1217	6.	1218	6.	1219	6.
1220	6.	1221	6.	1222	6.	1223	5.	1224	5.
1225	5.	1226	5.	1227	5.	1228	5.	1229	5.
1230	5.	1231	5.	1232	5.	1233	5.	1234	5.
1235	5.	1236	5.	1237	5.	1238	5.	1239	5.
1240	5.	1241	5.	1242	5.	1243	5.	1244	5.
1245	5.	1246	5.	1247	5.	1248	5.	1249	5.
1250	5.	1251	5.	1252	5.	1253	5.	1254	5.
1255	5.	1256	5.	1257	5.	1258	5.	1259	5.
1260	5.	1261	5.	1262	4.	1263	4.	1264	4.
1265	4.	1266	4.	1267	4.	1268	4.	1269	4.
1270	4.	1271	3.	1272	3.	1273	3.	1274	3.
1275	3.	1276	3.	1277	3.	1278	3.	1279	3.
1280	3.	1281	3.	1282	3.	1283	3.	1284	3.
1285	3.	1286	3.	1287	3.	1288	3.	1289	3.
1290	3.	1291	3.	1292	3.	1293	3.	1294	3.
1295	3.	1296	3.	1297	3.	1298	3.	1299	3.
1300	3.	1310	2.	1320	2.	1330	2.	1340	2.
1350	1.	1360	1.	1370	1.	1380	1.	1390	1.
1400	1.	1420	1.	1440	0.	1460	0.	1500	0.

Total Runoff = 7.634 Acre-Ft.
Peak Q = 79 CFS
Time to Peak Q = 1155 Minutes

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY
EX COND 50 YR Q IN INVERNESS AT CORONA FROM NORTH/WEST
HYDROGRAPH AT 3679 19C STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	0.	200	1.	300	1.	400	1.
500	2.	600	3.	700	4.	800	5.	900	7.
1000	8.	1050	11.	1100	11.	1110	11.	1120	13.
1130	15.	1131	16.	1132	16.	1133	17.	1134	17.
1135	18.	1136	18.	1137	19.	1138	20.	1139	20.
1140	21.	1141	22.	1142	23.	1143	24.	1144	24.
1145	25.	1146	26.	1147	27.	1148	28.	1149	32.
1150	37.	1151	47.	1152	65.	1153	82.	1154	95.
1155	100.	1156	95.	1157	83.	1158	72.	1159	63.
1160	58.	1161	53.	1162	48.	1163	41.	1164	32.
1165	24.	1166	20.	1167	17.	1168	16.	1169	15.
1170	14.	1171	14.	1172	13.	1173	13.	1174	13.
1175	12.	1176	12.	1177	12.	1178	11.	1179	11.
1180	11.	1181	11.	1182	10.	1183	10.	1184	10.
1185	10.	1186	10.	1187	10.	1188	10.	1189	10.
1190	10.	1191	10.	1192	10.	1193	9.	1194	9.
1195	9.	1196	9.	1197	9.	1198	9.	1199	9.
1200	9.	1201	8.	1202	8.	1203	8.	1204	8.
1205	8.	1206	8.	1207	8.	1208	8.	1209	8.
1210	8.	1211	8.	1212	8.	1213	8.	1214	8.
1215	8.	1216	7.	1217	7.	1218	7.	1219	7.
1220	7.	1221	7.	1222	7.	1223	7.	1224	7.
1225	7.	1226	6.	1227	6.	1228	6.	1229	6.
1230	6.	1231	6.	1232	6.	1233	6.	1234	6.
1235	6.	1236	6.	1237	6.	1238	6.	1239	6.
1240	6.	1241	6.	1242	6.	1243	6.	1244	6.
1245	6.	1246	6.	1247	6.	1248	6.	1249	6.
1250	6.	1251	6.	1252	6.	1253	6.	1254	6.
1255	6.	1256	6.	1257	6.	1258	6.	1259	6.
1260	6.	1261	5.	1262	5.	1263	5.	1264	5.
1265	5.	1266	5.	1267	5.	1268	5.	1269	4.
1270	4.	1271	4.	1272	4.	1273	4.	1274	4.
1275	4.	1276	4.	1277	4.	1278	4.	1279	4.
1280	4.	1281	4.	1282	4.	1283	4.	1284	4.
1285	4.	1286	4.	1287	4.	1288	4.	1289	4.
1290	4.	1291	4.	1292	4.	1293	4.	1294	4.
1295	4.	1296	4.	1297	4.	1298	4.	1299	4.
1300	4.	1310	3.	1320	2.	1330	2.	1340	2.
1350	2.	1360	1.	1370	1.	1380	1.	1390	1.
1400	1.	1420	1.	1440	1.	1460	0.	1500	0.

Total Runoff = 9.364 Acre-Ft.
Peak Q = 100 CFS
Time to Peak Q = 1155 Minutes

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY
EX COND 50 YR Q AT INVERNESS & ST KATHERINE

HYDROGRAPH AT 3679 20D STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	0.	200	0.	300	1.	400	1.
500	1.	600	2.	700	3.	800	4.	900	5.
1000	6.	1050	8.	1100	8.	1110	8.	1120	10.
1130	11.	1131	12.	1132	12.	1133	12.	1134	13.
1135	13.	1136	13.	1137	14.	1138	14.	1139	15.
1140	15.	1141	16.	1142	17.	1143	17.	1144	18.
1145	18.	1146	19.	1147	20.	1148	21.	1149	24.
1150	28.	1151	36.	1152	50.	1153	56.	1154	57.
1155	57.	1156	56.	1157	55.	1158	54.	1159	53.
1160	51.	1161	47.	1162	42.	1163	33.	1164	19.
1165	13.	1166	11.	1167	11.	1168	10.	1169	10.
1170	10.	1171	10.	1172	9.	1173	9.	1174	9.
1175	9.	1176	9.	1177	8.	1178	8.	1179	8.
1180	8.	1181	7.	1182	7.	1183	7.	1184	7.
1185	7.	1186	7.	1187	7.	1188	7.	1189	7.
1190	7.	1191	7.	1192	7.	1193	7.	1194	7.
1195	7.	1196	6.	1197	6.	1198	6.	1199	6.
1200	6.	1201	6.	1202	6.	1203	6.	1204	6.
1205	6.	1206	6.	1207	6.	1208	6.	1209	6.
1210	6.	1211	6.	1212	6.	1213	6.	1214	6.
1215	5.	1216	5.	1217	5.	1218	5.	1219	5.
1220	5.	1221	5.	1222	5.	1223	5.	1224	5.
1225	5.	1226	5.	1227	5.	1228	5.	1229	5.
1230	5.	1231	5.	1232	5.	1233	4.	1234	4.
1235	4.	1236	4.	1237	4.	1238	4.	1239	4.
1240	4.	1241	4.	1242	4.	1243	4.	1244	4.
1245	4.	1246	4.	1247	4.	1248	4.	1249	4.
1250	4.	1251	4.	1252	4.	1253	4.	1254	4.
1255	4.	1256	4.	1257	4.	1258	4.	1259	4.
1260	4.	1261	4.	1262	4.	1263	4.	1264	3.
1265	3.	1266	3.	1267	3.	1268	3.	1269	3.
1270	3.	1271	3.	1272	3.	1273	3.	1274	3.
1275	3.	1276	3.	1277	3.	1278	3.	1279	3.
1280	3.	1281	3.	1282	3.	1283	3.	1284	3.
1285	3.	1286	3.	1287	3.	1288	3.	1289	3.
1290	3.	1291	3.	1292	3.	1293	3.	1294	3.
1295	3.	1296	3.	1297	3.	1298	3.	1299	3.
1300	3.	1310	2.	1320	2.	1330	2.	1340	2.
1350	1.	1360	1.	1370	1.	1380	1.	1390	1.
1400	1.	1420	0.	1440	0.	1460	0.	1500	0.

Total Runoff = 6.725 Acre-Ft.
Peak Q = 57 CFS
Time to Peak Q = 1154 Minutes

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY
EX COND 50 YR Q IN INVERNESS AT CORONA FROM SOUTH/EAST

HYDROGRAPH AT 3679 21D STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	0.	200	1.	300	1.	400	2.
500	2.	600	3.	700	4.	800	5.	900	6.
1000	8.	1050	11.	1100	10.	1110	11.	1120	13.
1130	15.	1131	15.	1132	15.	1133	16.	1134	16.
1135	17.	1136	17.	1137	18.	1138	18.	1139	19.
1140	19.	1141	20.	1142	21.	1143	22.	1144	22.
1145	23.	1146	24.	1147	25.	1148	26.	1149	29.
1150	32.	1151	40.	1152	53.	1153	65.	1154	75.
1155	79.	1156	79.	1157	74.	1158	65.	1159	61.
1160	59.	1161	57.	1162	54.	1163	51.	1164	45.
1165	37.	1166	29.	1167	23.	1168	19.	1169	17.
1170	15.	1171	14.	1172	14.	1173	13.	1174	13.
1175	12.	1176	12.	1177	12.	1178	11.	1179	11.
1180	11.	1181	11.	1182	11.	1183	10.	1184	10.
1185	10.	1186	10.	1187	10.	1188	10.	1189	10.
1190	10.	1191	10.	1192	9.	1193	9.	1194	9.
1195	9.	1196	9.	1197	9.	1198	9.	1199	9.
1200	9.	1201	8.	1202	8.	1203	8.	1204	8.
1205	8.	1206	8.	1207	8.	1208	8.	1209	8.
1210	8.	1211	8.	1212	8.	1213	8.	1214	8.
1215	8.	1216	7.	1217	7.	1218	7.	1219	7.
1220	7.	1221	7.	1222	7.	1223	7.	1224	7.
1225	7.	1226	6.	1227	6.	1228	6.	1229	6.
1230	6.	1231	6.	1232	6.	1233	6.	1234	6.
1235	6.	1236	6.	1237	6.	1238	6.	1239	6.
1240	6.	1241	6.	1242	6.	1243	6.	1244	6.
1245	6.	1246	6.	1247	6.	1248	6.	1249	6.
1250	6.	1251	6.	1252	6.	1253	6.	1254	6.
1255	6.	1256	6.	1257	6.	1258	6.	1259	6.
1260	6.	1261	5.	1262	5.	1263	5.	1264	5.
1265	5.	1266	5.	1267	5.	1268	5.	1269	5.
1270	4.	1271	4.	1272	4.	1273	4.	1274	4.
1275	4.	1276	4.	1277	4.	1278	4.	1279	4.
1280	4.	1281	4.	1282	4.	1283	4.	1284	4.
1285	4.	1286	4.	1287	4.	1288	4.	1289	4.
1290	4.	1291	4.	1292	4.	1293	4.	1294	4.
1295	4.	1296	4.	1297	4.	1298	4.	1299	4.
1300	4.	1310	3.	1320	2.	1330	2.	1340	2.
1350	2.	1360	1.	1370	1.	1380	1.	1390	1.
1400	1.	1420	1.	1440	1.	1460	0.	1500	0.

Total Runoff = 9.217 Acre-Ft.
Peak Q = 79 CFS
Time to Peak Q = 1155 Minutes

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY
EX CONDITION 50 YR TOTAL Q AT INVERNESS & CORONA

HYDROGRAPH AT 3679 24C STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	1.	200	1.	300	2.	400	3.
500	4.	600	6.	700	8.	800	11.	900	13.
1000	17.	1050	22.	1100	22.	1110	23.	1120	27.
1130	31.	1131	32.	1132	33.	1133	33.	1134	34.
1135	35.	1136	37.	1137	38.	1138	39.	1139	40.
1140	42.	1141	43.	1142	45.	1143	46.	1144	48.
1145	50.	1146	52.	1147	54.	1148	56.	1149	62.
1150	71.	1151	89.	1152	122.	1153	153.	1154	176.
1155	186.	1156	180.	1157	161.	1158	141.	1159	126.
1160	118.	1161	111.	1162	104.	1163	93.	1164	80.
1165	65.	1166	52.	1167	43.	1168	37.	1169	33.
1170	31.	1171	30.	1172	28.	1173	27.	1174	26.
1175	25.	1176	25.	1177	24.	1178	23.	1179	23.
1180	23.	1181	22.	1182	22.	1183	21.	1184	21.
1185	21.	1186	20.	1187	20.	1188	20.	1189	20.
1190	20.	1191	20.	1192	20.	1193	19.	1194	19.
1195	19.	1196	19.	1197	18.	1198	18.	1199	18.
1200	18.	1201	18.	1202	17.	1203	17.	1204	17.
1205	17.	1206	17.	1207	17.	1208	17.	1209	17.
1210	17.	1211	17.	1212	17.	1213	16.	1214	16.
1215	16.	1216	15.	1217	15.	1218	15.	1219	15.
1220	14.	1221	14.	1222	14.	1223	14.	1224	14.
1225	13.	1226	13.	1227	13.	1228	13.	1229	13.
1230	13.	1231	13.	1232	13.	1233	13.	1234	13.
1235	13.	1236	13.	1237	12.	1238	12.	1239	12.
1240	12.	1241	12.	1242	12.	1243	12.	1244	12.
1245	12.	1246	12.	1247	11.	1248	11.	1249	11.
1250	11.	1251	11.	1252	11.	1253	11.	1254	11.
1255	11.	1256	11.	1257	11.	1258	11.	1259	11.
1260	11.	1261	11.	1262	11.	1263	11.	1264	11.
1265	10.	1266	10.	1267	10.	1268	9.	1269	9.
1270	9.	1271	9.	1272	9.	1273	8.	1274	8.
1275	8.	1276	8.	1277	8.	1278	8.	1279	8.
1280	8.	1281	8.	1282	8.	1283	8.	1284	8.
1285	8.	1286	8.	1287	8.	1288	8.	1289	8.
1290	8.	1291	8.	1292	8.	1293	8.	1294	8.
1295	8.	1296	8.	1297	8.	1298	8.	1299	8.
1300	8.	1310	6.	1320	5.	1330	5.	1340	5.
1350	3.	1360	2.	1370	2.	1380	2.	1390	2.
1400	2.	1420	1.	1440	1.	1460	1.	1500	1.

Total Runoff = 19.115 Acre-Ft.
Peak Q = 186 CFS
Time to Peak Q = 1155 Minutes

#3679.00

Ex/ PRE-DEV (w/ EX. STREETS)

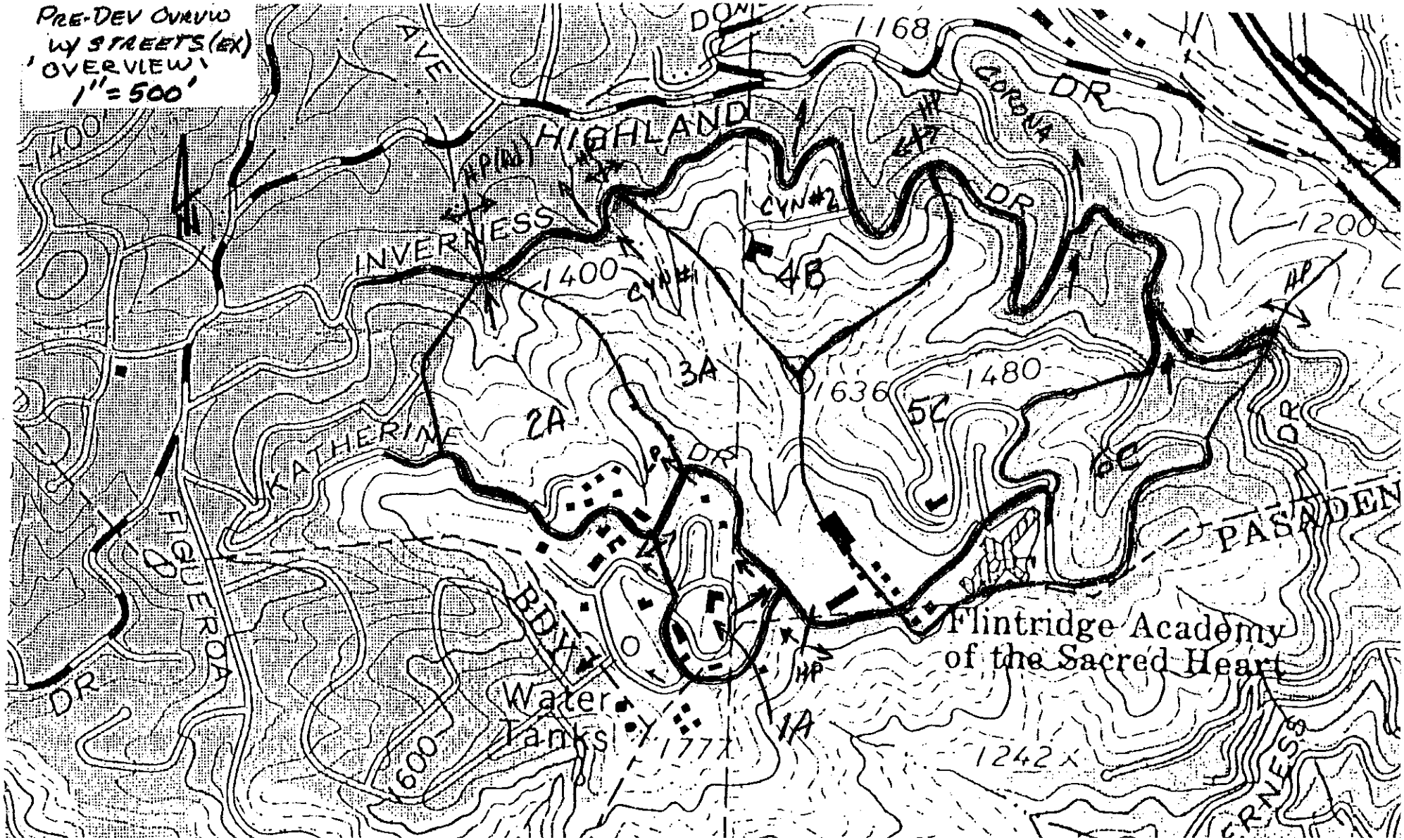
DA(MAP)		MORA DA	MORA AREA
1A	=	1A	11 Ac
2A	=	4A	23 Ac
3A	=	7A	31 Ac
4B	=	8B	21 Ac
5C	=	11C	41 Ac
6C	=	10C	23 Ac

TOTAL AREA = 150 Ac.

Q_{50} @ CYN #1 = 116 CFS

Q_{50} @ CYN #2 = 59 CFS

Q_{50} @ INVERNESS/CORONA = 141 CFS



LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY

KUDGRAVE PRE-DEV/EX COND 50 YR STORM(WITH EX STREETS) 8/14/01 STORM DAY 4

LOCATION		SUBAREA AREA	SUBAREA Q	TOTAL AREA	TOTAL Q	CONV TYPE	CONV LNGTH	CONV SLOPE	CONV SIZE	CONV Z	CONTROL Q	SOIL NAME	TC	RAIN ZONE	PCT IMPV
3679	1A	11.	38.	11.	38.	0	0.	0.00000	0.00	0.00	0.	68	8	L50	0.22
3679	2A	0.	0.	11.	38.	3	850.	0.10000	0.00	0.00	0.	68	99	L50	0.00
3679	3A	0.	0.	11.	37.	1	1400.	0.12500	0.00	0.00	0.	68	99	L50	0.00
3679	4A	23.	61.	34.	82.	0	0.	0.00000	0.00	0.00	0.	68	11	L50	0.10

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* CONFLUENCE Q'S *

* 3679 5A TA 1159 QA 82. QAF 41. QF 41. 3679 5F TF 1159 QF 41. QFA 41. QA 82. *

* 3679 5AF TAF 1159 QAF 41. QA 82. QF 41. *

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LOCATION		SUBAREA AREA	SUBAREA Q	TOTAL AREA	TOTAL Q	CONV TYPE	CONV LNGTH	CONV SLOPE	CONV SIZE	CONV Z	CONTROL Q	SOIL NAME	TC	RAIN ZONE	PCT IMPV
3679	5AF	0.	41.	34.	41.	0	0.	0.00000	0.00	0.00	50.	68	0	L50	0.00
3679	6A	0.	0.	34.	41.	3	550.	0.06000	0.00	0.00	0.	68	99	L50	0.00
3679	7A	31.	82.	65.	116.	0	0.	0.00000	0.00	0.00	0.	68	11	L50	0.10
3679	8B	21.	59.	21.	59.	0	0.	0.00000	0.00	0.00	0.	68	10	L50	0.10
3679	9B	0.	0.	21.	59.	0	0.	0.00000	0.00	0.00	0.	68	99	L50	0.00
3679	10C	23.	57.	23.	57.	3	1200.	0.10000	0.00	0.00	0.	68	12	L50	0.10
3679	11C	41.	88.	64.	141.	0	0.	0.00000	0.00	0.00	0.	68	15	L50	0.10
3679	12C	0.	0.	64.	141.	0	0.	0.00000	0.00	0.00	0.	68	99	L50	0.00

8-20-2001 SITE LICENSEE: SPINDLER ENGINEERING

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY
PRE-DEV/EX COND 50 YR Q AT SUMP PT IN ST KATHERINE DR
HYDROGRAPH AT 3679 2A STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	0.	200	0.	300	1.	400	1.
500	1.	600	1.	700	2.	800	2.	900	3.
1000	4.	1050	5.	1100	4.	1110	5.	1120	6.
1130	6.	1131	7.	1132	7.	1133	7.	1134	7.
1135	7.	1136	8.	1137	8.	1138	8.	1139	9.
1140	9.	1141	9.	1142	9.	1143	10.	1144	10.
1145	10.	1146	11.	1147	11.	1148	12.	1149	14.
1150	17.	1151	23.	1152	33.	1153	37.	1154	38.
1155	38.	1156	36.	1157	33.	1158	30.	1159	23.
1160	12.	1161	8.	1162	7.	1163	6.	1164	6.
1165	6.	1166	6.	1167	6.	1168	5.	1169	5.
1170	5.	1171	5.	1172	5.	1173	5.	1174	5.
1175	5.	1176	5.	1177	4.	1178	4.	1179	4.
1180	4.	1181	4.	1182	4.	1183	4.	1184	4.
1185	4.	1186	4.	1187	4.	1188	4.	1189	4.
1190	4.	1191	4.	1192	4.	1193	4.	1194	4.
1195	4.	1196	4.	1197	4.	1198	4.	1199	4.
1200	4.	1201	4.	1202	4.	1203	4.	1204	4.
1205	4.	1206	4.	1207	4.	1208	4.	1209	4.
1210	4.	1211	3.	1212	3.	1213	3.	1214	3.
1215	3.	1216	3.	1217	3.	1218	3.	1219	3.
1220	3.	1221	3.	1222	3.	1223	3.	1224	3.
1225	3.	1226	3.	1227	3.	1228	3.	1229	3.
1230	3.	1231	3.	1232	3.	1233	3.	1234	3.
1235	3.	1236	3.	1237	3.	1238	3.	1239	3.
1240	3.	1241	3.	1242	3.	1243	3.	1244	3.
1245	3.	1246	3.	1247	3.	1248	3.	1249	3.
1250	3.	1251	3.	1252	3.	1253	3.	1254	3.
1255	3.	1256	3.	1257	3.	1258	3.	1259	3.
1260	3.	1261	2.	1262	2.	1263	2.	1264	2.
1265	2.	1266	2.	1267	2.	1268	2.	1269	2.
1270	2.	1271	2.	1272	2.	1273	2.	1274	2.
1275	2.	1276	2.	1277	2.	1278	2.	1279	2.
1280	2.	1281	2.	1282	2.	1283	2.	1284	2.
1285	2.	1286	2.	1287	2.	1288	2.	1289	2.
1290	2.	1291	2.	1292	2.	1293	2.	1294	2.
1295	2.	1296	2.	1297	2.	1298	2.	1299	2.
1300	2.	1310	1.	1320	1.	1330	1.	1340	1.
1350	1.	1360	1.	1370	1.	1380	1.	1390	1.
1400	1.	1420	0.	1440	0.	1460	0.	1500	0.

Total Runoff = 4.099 Acre-Ft.
Peak Q = 38 CFS
Time to Peak Q = 1154 Minutes

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY
PRE-DEV/EX COND 50 YR STORM Q AT INVERNESS BEFORE 50/50 SPLI

HYDROGRAPH AT 3679 4A STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	1.	200	1.	300	1.	400	2.
500	2.	600	3.	700	5.	800	6.	900	8.
1000	9.	1050	12.	1100	12.	1110	13.	1120	15.
1130	17.	1131	17.	1132	18.	1133	18.	1134	18.
1135	19.	1136	19.	1137	20.	1138	21.	1139	21.
1140	22.	1141	23.	1142	23.	1143	24.	1144	25.
1145	26.	1146	27.	1147	28.	1148	29.	1149	33.
1150	37.	1151	47.	1152	63.	1153	69.	1154	71.
1155	72.	1156	74.	1157	77.	1158	80.	1159	82.
1160	81.	1161	77.	1162	67.	1163	50.	1164	42.
1165	37.	1166	33.	1167	30.	1168	27.	1169	24.
1170	22.	1171	20.	1172	19.	1173	18.	1174	17.
1175	16.	1176	16.	1177	15.	1178	14.	1179	14.
1180	13.	1181	13.	1182	13.	1183	13.	1184	12.
1185	12.	1186	12.	1187	12.	1188	12.	1189	12.
1190	12.	1191	11.	1192	11.	1193	11.	1194	11.
1195	11.	1196	11.	1197	11.	1198	10.	1199	10.
1200	10.	1201	10.	1202	10.	1203	10.	1204	10.
1205	10.	1206	10.	1207	10.	1208	10.	1209	10.
1210	10.	1211	9.	1212	9.	1213	9.	1214	9.
1215	9.	1216	9.	1217	9.	1218	9.	1219	8.
1220	8.	1221	8.	1222	8.	1223	8.	1224	8.
1225	8.	1226	8.	1227	8.	1228	8.	1229	8.
1230	8.	1231	8.	1232	8.	1233	7.	1234	7.
1235	7.	1236	7.	1237	7.	1238	7.	1239	7.
1240	7.	1241	7.	1242	7.	1243	7.	1244	7.
1245	7.	1246	7.	1247	7.	1248	7.	1249	7.
1250	7.	1251	7.	1252	7.	1253	7.	1254	7.
1255	7.	1256	7.	1257	7.	1258	7.	1259	7.
1260	7.	1261	6.	1262	6.	1263	6.	1264	6.
1265	6.	1266	6.	1267	6.	1268	6.	1269	5.
1270	5.	1271	5.	1272	5.	1273	5.	1274	5.
1275	5.	1276	5.	1277	5.	1278	5.	1279	5.
1280	5.	1281	5.	1282	5.	1283	5.	1284	5.
1285	5.	1286	5.	1287	5.	1288	5.	1289	5.
1290	5.	1291	5.	1292	5.	1293	5.	1294	5.
1295	5.	1296	5.	1297	5.	1298	5.	1299	5.
1300	5.	1310	3.	1320	3.	1330	3.	1340	3.
1350	2.	1360	2.	1370	2.	1380	1.	1390	1.
1400	1.	1420	1.	1440	1.	1460	0.	1500	0.

Total Runoff = 10.825 Acre-Ft.
Peak Q = 82 CFS
Time to Peak Q = 1159 Minutes

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY
PRE-DEV/EX CONDITION 50 YR Q AFTER SPLIT

HYDROGRAPH AT 3679 6A STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	0.	200	0.	300	1.	400	1.
500	1.	600	2.	700	2.	800	3.	900	4.
1000	5.	1050	6.	1100	6.	1110	7.	1120	7.
1130	8.	1131	9.	1132	9.	1133	9.	1134	9.
1135	9.	1136	10.	1137	10.	1138	10.	1139	11.
1140	11.	1141	11.	1142	12.	1143	12.	1144	12.
1145	13.	1146	13.	1147	14.	1148	15.	1149	16.
1150	19.	1151	23.	1152	31.	1153	34.	1154	36.
1155	36.	1156	37.	1157	38.	1158	40.	1159	41.
1160	40.	1161	38.	1162	34.	1163	25.	1164	21.
1165	18.	1166	16.	1167	15.	1168	13.	1169	12.
1170	11.	1171	10.	1172	10.	1173	9.	1174	9.
1175	8.	1176	8.	1177	7.	1178	7.	1179	7.
1180	7.	1181	7.	1182	6.	1183	6.	1184	6.
1185	6.	1186	6.	1187	6.	1188	6.	1189	6.
1190	6.	1191	6.	1192	6.	1193	6.	1194	5.
1195	5.	1196	5.	1197	5.	1198	5.	1199	5.
1200	5.	1201	5.	1202	5.	1203	5.	1204	5.
1205	5.	1206	5.	1207	5.	1208	5.	1209	5.
1210	5.	1211	5.	1212	5.	1213	5.	1214	5.
1215	4.	1216	4.	1217	4.	1218	4.	1219	4.
1220	4.	1221	4.	1222	4.	1223	4.	1224	4.
1225	4.	1226	4.	1227	4.	1228	4.	1229	4.
1230	4.	1231	4.	1232	4.	1233	4.	1234	4.
1235	4.	1236	4.	1237	4.	1238	4.	1239	4.
1240	3.	1241	3.	1242	3.	1243	3.	1244	3.
1245	3.	1246	3.	1247	3.	1248	3.	1249	3.
1250	3.	1251	3.	1252	3.	1253	3.	1254	3.
1255	3.	1256	3.	1257	3.	1258	3.	1259	3.
1260	3.	1261	3.	1262	3.	1263	3.	1264	3.
1265	3.	1266	3.	1267	3.	1268	3.	1269	3.
1270	3.	1271	3.	1272	3.	1273	3.	1274	3.
1275	3.	1276	3.	1277	2.	1278	2.	1279	2.
1280	2.	1281	2.	1282	2.	1283	2.	1284	2.
1285	2.	1286	2.	1287	2.	1288	2.	1289	2.
1290	2.	1291	2.	1292	2.	1293	2.	1294	2.
1295	2.	1296	2.	1297	2.	1298	2.	1299	2.
1300	2.	1310	2.	1320	2.	1330	1.	1340	1.
1350	1.	1360	1.	1370	1.	1380	1.	1390	1.
1400	1.	1420	0.	1440	0.	1460	0.	1500	0.

Total Runoff = 5.360 Acre-Ft.
Peak Q = 41 CFS
Time to Peak Q = 1159 Minutes

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY
PRE-DEV/X 50 YR Q AT SUMP PT SPILL OVER TO NATURAL CANYON #1
HYDROGRAPH AT 3679 7A STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	1.	200	1.	300	2.	400	2.
500	3.	600	4.	700	6.	800	8.	900	10.
1000	13.	1050	17.	1100	16.	1110	18.	1120	20.
1130	24.	1131	24.	1132	25.	1133	25.	1134	26.
1135	26.	1136	27.	1137	28.	1138	29.	1139	30.
1140	31.	1141	33.	1142	34.	1143	35.	1144	36.
1145	37.	1146	39.	1147	40.	1148	42.	1149	47.
1150	54.	1151	68.	1152	93.	1153	106.	1154	114.
1155	116.	1156	116.	1157	115.	1158	115.	1159	113.
1160	109.	1161	101.	1162	86.	1163	62.	1164	48.
1165	40.	1166	35.	1167	32.	1168	30.	1169	28.
1170	27.	1171	25.	1172	24.	1173	23.	1174	22.
1175	21.	1176	20.	1177	19.	1178	19.	1179	18.
1180	17.	1181	17.	1182	17.	1183	16.	1184	16.
1185	16.	1186	16.	1187	16.	1188	16.	1189	16.
1190	15.	1191	15.	1192	15.	1193	15.	1194	15.
1195	14.	1196	14.	1197	14.	1198	14.	1199	14.
1200	13.	1201	13.	1202	13.	1203	13.	1204	13.
1205	13.	1206	13.	1207	13.	1208	13.	1209	13.
1210	13.	1211	13.	1212	12.	1213	12.	1214	12.
1215	12.	1216	12.	1217	11.	1218	11.	1219	11.
1220	11.	1221	11.	1222	10.	1223	10.	1224	10.
1225	10.	1226	10.	1227	10.	1228	10.	1229	10.
1230	10.	1231	10.	1232	10.	1233	10.	1234	10.
1235	10.	1236	10.	1237	9.	1238	9.	1239	9.
1240	9.	1241	9.	1242	9.	1243	9.	1244	9.
1245	9.	1246	9.	1247	9.	1248	9.	1249	9.
1250	9.	1251	9.	1252	9.	1253	9.	1254	9.
1255	9.	1256	9.	1257	9.	1258	9.	1259	9.
1260	9.	1261	8.	1262	8.	1263	8.	1264	8.
1265	8.	1266	7.	1267	7.	1268	7.	1269	7.
1270	7.	1271	6.	1272	6.	1273	6.	1274	6.
1275	6.	1276	6.	1277	6.	1278	6.	1279	6.
1280	6.	1281	6.	1282	6.	1283	6.	1284	6.
1285	6.	1286	6.	1287	6.	1288	6.	1289	6.
1290	6.	1291	6.	1292	6.	1293	6.	1294	6.
1295	6.	1296	6.	1297	6.	1298	6.	1299	6.
1300	6.	1310	4.	1320	4.	1330	4.	1340	4.
1350	2.	1360	2.	1370	2.	1380	2.	1390	2.
1400	2.	1420	1.	1440	1.	1460	0.	1500	0.

Total Runoff = 14.445 Acre-Ft.
Peak Q = 116 CFS
Time to Peak Q = 1155 Minutes

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY
PRE-DEV/X 50 YR Q TO SUMP PT SPILL OVER TO NATURAL CANYON #2
HYDROGRAPH AT 3679 9B STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	0.	200	0.	300	1.	400	1.
500	1.	600	2.	700	3.	800	3.	900	4.
1000	5.	1050	7.	1100	7.	1110	8.	1120	9.
1130	11.	1131	11.	1132	11.	1133	11.	1134	12.
1135	12.	1136	12.	1137	13.	1138	13.	1139	14.
1140	15.	1141	15.	1142	16.	1143	16.	1144	17.
1145	17.	1146	18.	1147	19.	1148	20.	1149	23.
1150	27.	1151	36.	1152	52.	1153	58.	1154	59.
1155	59.	1156	58.	1157	56.	1158	55.	1159	50.
1160	45.	1161	35.	1162	19.	1163	13.	1164	11.
1165	10.	1166	10.	1167	9.	1168	9.	1169	9.
1170	9.	1171	9.	1172	8.	1173	8.	1174	8.
1175	8.	1176	8.	1177	7.	1178	7.	1179	7.
1180	7.	1181	7.	1182	7.	1183	7.	1184	7.
1185	7.	1186	6.	1187	6.	1188	6.	1189	6.
1190	6.	1191	6.	1192	6.	1193	6.	1194	6.
1195	6.	1196	6.	1197	6.	1198	6.	1199	6.
1200	5.	1201	5.	1202	5.	1203	5.	1204	5.
1205	5.	1206	5.	1207	5.	1208	5.	1209	5.
1210	5.	1211	5.	1212	5.	1213	5.	1214	5.
1215	5.	1216	5.	1217	5.	1218	4.	1219	4.
1220	4.	1221	4.	1222	4.	1223	4.	1224	4.
1225	4.	1226	4.	1227	4.	1228	4.	1229	4.
1230	4.	1231	4.	1232	4.	1233	4.	1234	4.
1235	4.	1236	4.	1237	4.	1238	4.	1239	4.
1240	4.	1241	4.	1242	4.	1243	4.	1244	4.
1245	4.	1246	4.	1247	4.	1248	4.	1249	4.
1250	4.	1251	4.	1252	4.	1253	4.	1254	4.
1255	4.	1256	4.	1257	4.	1258	4.	1259	4.
1260	4.	1261	4.	1262	3.	1263	3.	1264	3.
1265	3.	1266	3.	1267	3.	1268	3.	1269	3.
1270	3.	1271	3.	1272	3.	1273	3.	1274	3.
1275	3.	1276	3.	1277	3.	1278	3.	1279	3.
1280	3.	1281	3.	1282	3.	1283	3.	1284	3.
1285	3.	1286	3.	1287	3.	1288	3.	1289	3.
1290	3.	1291	3.	1292	3.	1293	3.	1294	3.
1295	3.	1296	3.	1297	3.	1298	3.	1299	3.
1300	3.	1310	1.	1320	1.	1330	1.	1340	1.
1350	1.	1360	1.	1370	1.	1380	1.	1390	1.
1400	1.	1420	0.	1440	0.	1460	0.	1500	0.

Total Runoff = 5.974 Acre-Ft.
Peak Q = 59 CFS
Time to Peak Q = 1154 Minutes

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY
PRE-DEV/RX CONDITION 50 YR Q AT INVERNESS & CORONA

HYDROGRAPH AT 3679 12C STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	0.	100	1.	200	1.	300	2.	400	3.
500	4.	600	6.	700	8.	800	10.	900	13.
1000	16.	1050	22.	1100	21.	1110	23.	1120	26.
1130	30.	1131	31.	1132	32.	1133	32.	1134	33.
1135	34.	1136	35.	1137	36.	1138	37.	1139	38.
1140	39.	1141	41.	1142	42.	1143	44.	1144	46.
1145	47.	1146	49.	1147	51.	1148	53.	1149	59.
1150	66.	1151	79.	1152	103.	1153	118.	1154	130.
1155	138.	1156	140.	1157	141.	1158	140.	1159	138.
1160	136.	1161	133.	1162	129.	1163	123.	1164	113.
1165	99.	1166	78.	1167	52.	1168	40.	1169	34.
1170	31.	1171	30.	1172	29.	1173	28.	1174	27.
1175	26.	1176	25.	1177	24.	1178	24.	1179	23.
1180	23.	1181	22.	1182	22.	1183	21.	1184	21.
1185	20.	1186	20.	1187	20.	1188	20.	1189	20.
1190	20.	1191	20.	1192	19.	1193	19.	1194	19.
1195	19.	1196	18.	1197	18.	1198	18.	1199	18.
1200	18.	1201	17.	1202	17.	1203	17.	1204	17.
1205	17.	1206	17.	1207	17.	1208	17.	1209	17.
1210	17.	1211	16.	1212	16.	1213	16.	1214	16.
1215	16.	1216	15.	1217	15.	1218	15.	1219	15.
1220	14.	1221	14.	1222	14.	1223	14.	1224	13.
1225	13.	1226	13.	1227	13.	1228	13.	1229	13.
1230	13.	1231	13.	1232	13.	1233	13.	1234	13.
1235	13.	1236	12.	1237	12.	1238	12.	1239	12.
1240	12.	1241	12.	1242	12.	1243	11.	1244	11.
1245	11.	1246	11.	1247	11.	1248	11.	1249	11.
1250	11.	1251	11.	1252	11.	1253	11.	1254	11.
1255	11.	1256	11.	1257	11.	1258	11.	1259	11.
1260	11.	1261	11.	1262	11.	1263	11.	1264	10.
1265	10.	1266	10.	1267	10.	1268	9.	1269	9.
1270	9.	1271	9.	1272	9.	1273	8.	1274	8.
1275	8.	1276	8.	1277	8.	1278	8.	1279	8.
1280	8.	1281	8.	1282	8.	1283	8.	1284	8.
1285	8.	1286	8.	1287	8.	1288	8.	1289	8.
1290	8.	1291	8.	1292	8.	1293	8.	1294	8.
1295	8.	1296	8.	1297	8.	1298	8.	1299	8.
1300	8.	1310	6.	1320	5.	1330	4.	1340	4.
1350	3.	1360	2.	1370	2.	1380	2.	1390	2.
1400	2.	1420	1.	1440	1.	1460	0.	1500	0.

Total Runoff = 18.634 Acre-Ft.
Peak Q = 141 CFS
Time to Peak Q = 1157 Minutes